

46th Annual Report
OF THE BOARD OF
Water and Power
COMMISSIONERS
OF THE CITY OF
Los Angeles



F I S C A L Y E A R E N D I N G J U N E 3 0 , 1 9 4 7





FLETCHER BOWRON
Mayor

Hon. Fletcher Bowron, Mayor
and Members of the City Council,
City Hall,
Los Angeles, California.

Gentlemen:

Transmitted herewith, in compliance with the provisions of Article IV, Section 64, of the City Charter, is the Forty-Sixth Annual Report of the Board of Water and Power Commissioners, covering the fiscal year ending June 30, 1947. The report covers the activities of the Water and Power Systems, and the several Joint Divisions of the Department of Water and Power. Attached for your information are copies of detailed statistical review of operations prepared by the Management.

The Board expresses its sincere appreciation of the many evidences of cooperation by the Mayor, the Council, and other Departments of the City government, and acknowledges the effective services of the management and personnel of this Department in the interests of community welfare.

Respectfully submitted,

BOARD OF WATER AND POWER COMMISSIONERS
OF THE CITY OF LOS ANGELES

President

LOS ANGELES BOARD OF WATER AND POWER COMMISSIONERS — 1947-48

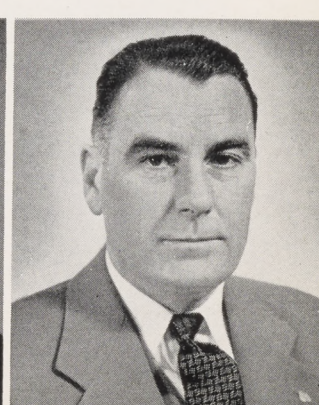
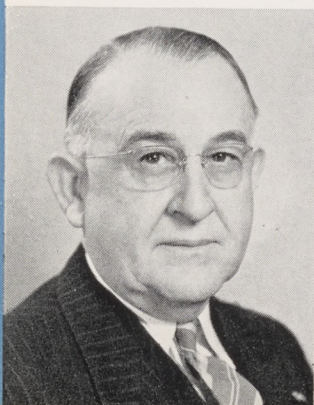
ROBERT A. HEFFNER

W. BALLENTINE HENLEY

WILLIAM A. HOLT, *President*

WILLIAM B. HIMROD

DUNCAN SHAW



TO THE HONORABLE,
THE BOARD OF WATER AND POWER COMMISSIONERS,
BUILDING.

Gentlemen:

Transmitted herewith is the Forty-sixth Annual Report of the Department of Water and Power, covering activities of the fiscal year ended June 30, 1947. Your attention is respectfully directed to the detailed summaries of the activities of the two Systems, submitted by the Chief Engineer of Water Works and the Chief Electrical Engineer, and the review of the year's transactions and current financial condition presented by the Controller and Chief Accounting Employee.

Unprecedented demands for extension of both water and power services which had to be met under conditions of extreme difficulty have been created by the population growth from the 1940 census figure of 1,540,000, to a currently estimated more than 1,900,000, with the accompanying expansion of industry.

Comparison of statistics covering demands for the year just closed, with those for the last pre-war peace year of 1940-41, a period during which construction of system extensions and betterments was not possible, emphasizes the need for progressing the capital improvement programs of the two systems with all possible speed. Over this six year period, the quantity of water necessary to supply the homes, businesses and industries of Los Angeles has increased by almost 52 per cent. The Electric System has experienced an increase of 248 per cent in the number of industrial customers, with a 160 per cent increase in energy consumed. Commercial accounts have risen by 6.7 per cent, with consumption up 39.8 per cent. The increase in number of residential customers has been 15 per cent, with average energy use per customer up 46 per cent.

A study of population growth indicates that this rapidly accelerating demand for water and power services will continue over future years. The City of Los Angeles, in 1920, had a population of 576,000. By 1940, it had grown to 1,540,000, an average increase of 46,400 annually. Development here of strategic industries caused a step-up in this rate to an average of 62,285 annually over the seven years since 1940. All indications point to a continuing population growth in excess of 50,000 yearly, with accompanying increases in commercial and industrial activity.

The reports herewith transmitted review the progress to date of construction of new facilities, which will involve expenditures of \$154,000,000 by the Electric System, and \$35,000,000 by the Water System over the ensuing six to seven years. The entire program of expansion, extension and betterment is being speeded to keep pace with the city's growth. Completion of the Harbor Steam Plant and the Owens Gorge hydroelectric project, which combined will add more than 400,000 kilowatts of new generating capacity, is scheduled for 1951. Earlier completion is impossible because of inability to secure earlier deliveries of generating equipment. With current demand for water almost equaling the safe limit of the combined Aqueduct and River supplies, the Water System is speeding plans for increased interconnections with the Metropolitan Water District of Southern California, to insure adequate provision to meet added water demands of the future, which must be supplied from the Colorado River.

The report of the Controller shows the financial condition of the Department gratifyingly sound, with considerable surplus available for immediate capital needs, accumulated during the war-years of no-construction. Working capital on hand June 30 was \$11,584,139 in the Water System, and \$35,244,477 in the Power System. Thus a total of almost \$47,000,000 is available for investment in the Department's seven year program of system expansion and betterment, which will require an estimated capital investment of \$189,000,000. The surplus, together with earnings during the years of construction, will finance a large portion of the program. Adoption by the citizens of Los Angeles of an amendment to the City Charter, which simplifies the procedures for issuance of revenue bonds, will expedite efficient and economic procedures in borrowing additional funds which may be required.

Assets of the combined systems total \$516,780,186.38 including a depreciation reserve of \$113,522,180. Total of the City's equity in the combined Water and Power Systems as of June 30 was \$246,238,017.78, while the bonded debt has been reduced to \$146,099,564.35, of which \$100,963,814.76 is against the Power System.

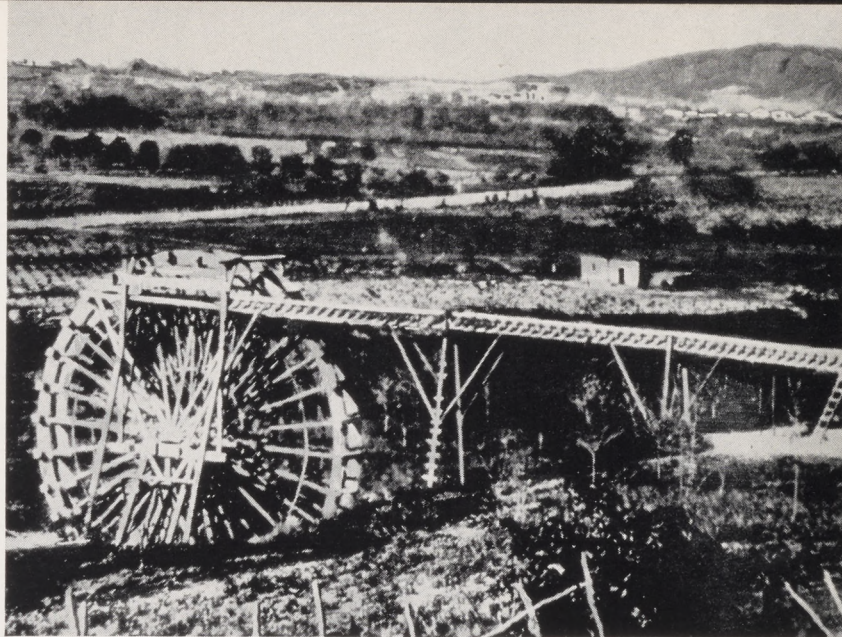
To the members of the Board of Water and Power Commissioners, and to executives and employees, I extend sincere appreciation of the whole-hearted cooperation extended me during the year.

Respectfully submitted,

Samuel W. Morris

General Manager and Chief Engineer

Foreword



Water wheels were part of city's early distribution system

The history of Los Angeles is inseparably linked to development of adequate supplies of low-cost water, and with water, its concomitant, electric power. To secure these supplies the community, located in a semi-arid region of limited rainfall, has found it necessary to import them from far-distant points.

Los Angeles owes its location to a river. Discovered Wednesday, August 2, 1769, by Franciscan missionaries, the water resources of the stream led to the founding on Tuesday, September 4, 1781, of El Pueblo de Nuestra Senora La Reina de Los Angeles. Eleven families, comprising 44 persons, established the new community, to raise supplies for a small Spanish occupation force. King Carlos III, of Spain, by royal decree, granted to the original Pueblo perpetual rights to all the waters of the Los Angeles River and the watershed which feeds it, a right held continuously since that time by the City of Los Angeles.

Operated under community ownership for almost 100 years, the municipal water system was leased by the Town Council in 1868 to a private company. Four years of negotiation and litigation were required before the City, in 1902, purchased the private company's distribution equipment and improvements for \$2,000,000. Municipal ownership and operation were inaugurated with an immediate rate cut of 63 per cent.

By 1905, a series of extremely dry years brought threat of a serious water shortage. The population of Los Angeles had reached 160,000, and studies of the river indicated a dependable source of water supply for a population of not more than 300,000 persons. Los Angeles built one of the most daring engineering enterprises of its time—a 238 mile Aqueduct to bring waters of the Owens River from the distant High Sierras, through mountains and across deserts, to the growing coastal city. Commenced in 1908, the Aqueduct project was completed in 1913 at a cost of \$24,500,000. It made available a water supply sufficient for a city of almost 2,000,000 persons.

During the next 20 years, the City continued its unprecedented growth, and the Department of Water and Power again was forced to look to the north for additional supplies of water, this time to the Mono Basin watershed on the east slopes of the Sierra Nevada. To collect the waters of five streams and add them to the Aqueduct supply, the system was

extended another 100 miles northward; an 11-mile tunnel bored through Mono Craters, and additional reservoirs constructed for collection and storage.

Although built primarily as a water project, engineering design of the Aqueduct included facilities for generation of hydro-electric power by harnessing the potential energy created by the water's drop of 2,619 feet from the original intake to the San Fernando Power Plant, at the Los Angeles end. Municipal distribution of electricity began in November of 1916. In 1922, the City purchased the electric distribution system of the Southern California Edison Company within the limits of Los Angeles. A similar purchase of the Los Angeles Gas and Electric Corporation electric system followed in 1937. Through acquisition, in 1939, of the Edison system in areas annexed since the original purchase, the Department of Water and Power became the city's sole distributor of electricity.

In the meantime, Department executives sought for sources of additional water, and of large supplies of low-cost hydro-electric energy essential if industrial expansion, sufficient to provide jobs for the constantly increasing population and to maintain a balanced economy, were to be realized. The Department was one of the leading forces in the long campaign to harness the Colorado River as a source of both water and electric energy for the Southwest. Completion of the Boulder Canyon Project in 1936 found the Municipal Power System prepared, with its \$23,000,000 double circuit Boulder transmission line completed, to carry the energy generated at Hoover Dam power plants to the City of Los Angeles, over 266 miles distant.

From a sleepy pueblo of a few thousand inhabitants, the City of Los Angeles has grown into a modern community, with a population nearing the 2,000,000 mark. It has become the center of the Nation's third largest metropolitan industrial area, leading the United States in diversity of industry. Low cost municipal water and electricity have been and continue to be major factors in this

development. From a crude, primitive system of canals and ditches, the Municipal Water System has expanded to the third largest distribution network in the United States, exceeded in size only by New York and Detroit. In 1922, before acquisition of the Edison Co. properties, the Power System was serving approximately 19,500 metered services. Today the System has over 590,000 customers. Although the City must import the greatest portion of its water and power supplies, rates are among the nation's lowest for cities of comparable size.



Building first municipal power distribution system

Water leaves east portal of 11-mile Mono Craters tunnel to join Owens River



Water Operations

The fiscal year 1946-47 was marked by the greatest demand for expansion of water distribution facilities in the history of the Los Angeles Department of Water and Power. Shortage of materials, essential to installation of water main extensions and service connections, particularly water meters and cast iron pipe, was unprecedentedly acute.

Normal delivery dates of 90 days on meters and pipe were extended by manufacturers to as much as 360 days. Even then, vendors found it difficult to meet extended schedules, and were unable to make deliveries on any firm basis. The water meter problem was met by providing water service on an estimated rather than a metered basis. The policy adopted for allocation of available pipe was to install services to those developments which would provide the greatest amount of new housing. Under this plan of operation, with minor exceptions, all completed houses were provided with water service before they were ready for occupancy. A very heavy backlog of new extensions has been accumulated, substantially all requests involving subdivisions in which little progress has been made in construction. Indications are that the amount of pipe available will soon be increased, and that careful allocation of supplies will continue to prevent delays in housing occupancy.

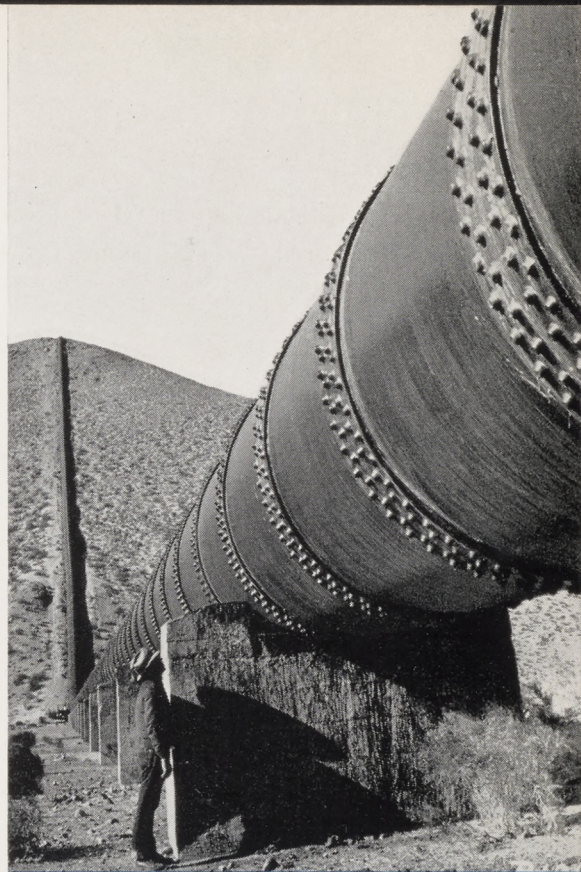
Engineering records of the Water System show a net addition of 61.2 miles of distribution mains during the year, while 14,335 service connections, 11,245 meters and 610 fire hydrants were added to the system.

At June 30, 1947, there were 4,427 miles of distribution mains, 4 inch to 78 inch in diameter, 415,275 service connections, 342,794 meters and 23,283 fire hydrants in the system. Service pipe, in sizes ranging from half-inch to 12 inches, totaled 7,520,582 feet.

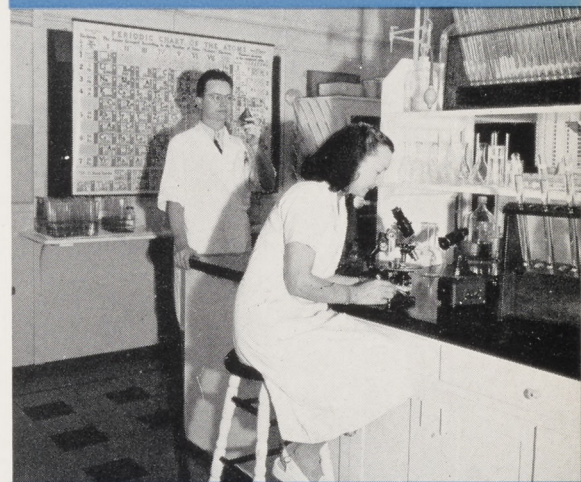
WATER CONSUMPTION

The great City of Los Angeles, sprawling over 452.6 square miles of area, required a constant average flow of 508.7 cubic feet per second, or 328,781,458 gallons per day, throughout the 12 months of the fiscal year ending June 30, 1947, to supply the water demands of its residences, businesses, industries, and public facilities. This represents an increase of 11.2 second feet.

Water sales averaged 312,459,044 gallons per day during the year. Highest consumption was registered on August 1, 1946, when it reached 820 cubic feet per second, or 529,943,000 gallons, 308 gallons of water for each man, woman and child served by the system. Highest month in terms of water usage was July, 1946, with an average daily consumption of 722.3 cubic feet per second, or 466,904,000 gallons per day. The month of April, 1947, estab-



One of huge steel siphons on Aqueduct system



Water is constantly checked to insure purity



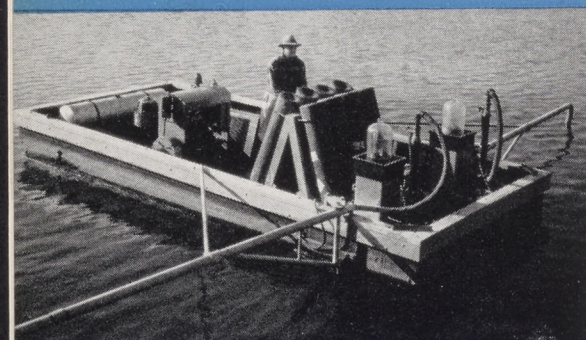
One of Water System's outdoor pumping plants



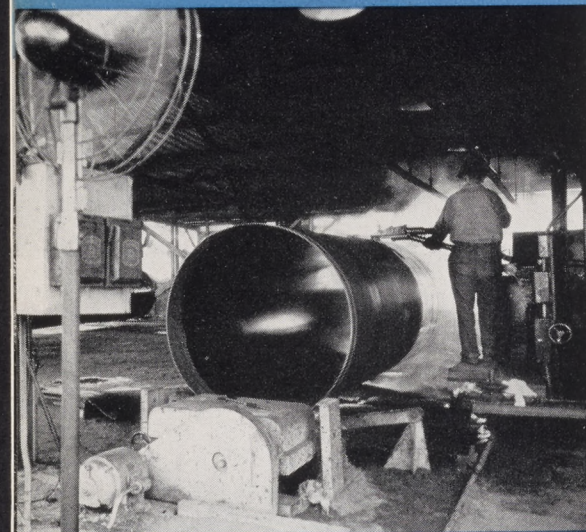
Another water main helps meet increased demand



Applying gunite to open lined Aqueduct section



Chlorination guarantees a safe supply of water



Water pipe is given a protective enamel coating

lished a new all-time record for water use for that season of the year, rising to 128 per cent of the highest previous April record, and to 160 per cent of the April average for the past ten years. Total deliveries for the twelve months aggregated 368,000 acre feet, or 120 billion gallons.

The Los Angeles Aqueduct, which brings water of the Owens River from the far-off Sierra Nevadas, was the source of 73.6 per cent of the year's supply. The Los Angeles River and local wells contributed 24.4 per cent. The balance of 2 per cent was Colorado River water, purchased through membership in the Metropolitan Water District of Southern California.

LOS ANGELES AQUEDUCT

The Los Angeles Aqueduct, chief source of water supply for Los Angeles since 1913, carried an average flow of 402.7 second feet, for a total of 95 billions of gallons, from Owens Valley to the terminal reservoirs in the metropolitan area. This was an increase of three per cent over the previous year, and represents 91 per cent of rated capacity, allowing for shutoffs for normal maintenance work, indicating the near approach of complete dependence upon Colorado River water to meet the City's future growth.

To permit carrying on of major maintenance work, two Aqueduct shutoffs covering 27 days were necessary on the Northern Division, and four, for an aggregate of 17 days, on the Southern Division. During two periods, totaling ten days, temporary adjustments in flow were necessary for inspection and maintenance purposes. Storage in Aqueduct reservoirs at June 30, 1947, totaled 237,309 acre feet, a decrease of 73,961 acre feet as compared to the previous year-end.

Precipitation in the Owens Valley-Mono Basin area was unusual in character. While the total for the year was 82 per cent of normal, more than 80 per cent of the rain and snowfall was concentrated in the October-December period of 1946. This created abnormally heavy discharge during the winter months, from streams tributary to the Aqueduct, and necessitated extensive spreading operations to keep within legal restrictions governing Aqueduct operation. The spring runoff was relatively light and short, leaving sufficient storage space in reservoirs so that spreading will probably be unnecessary next year. Spread water is available for later ground water pumping in dry years.

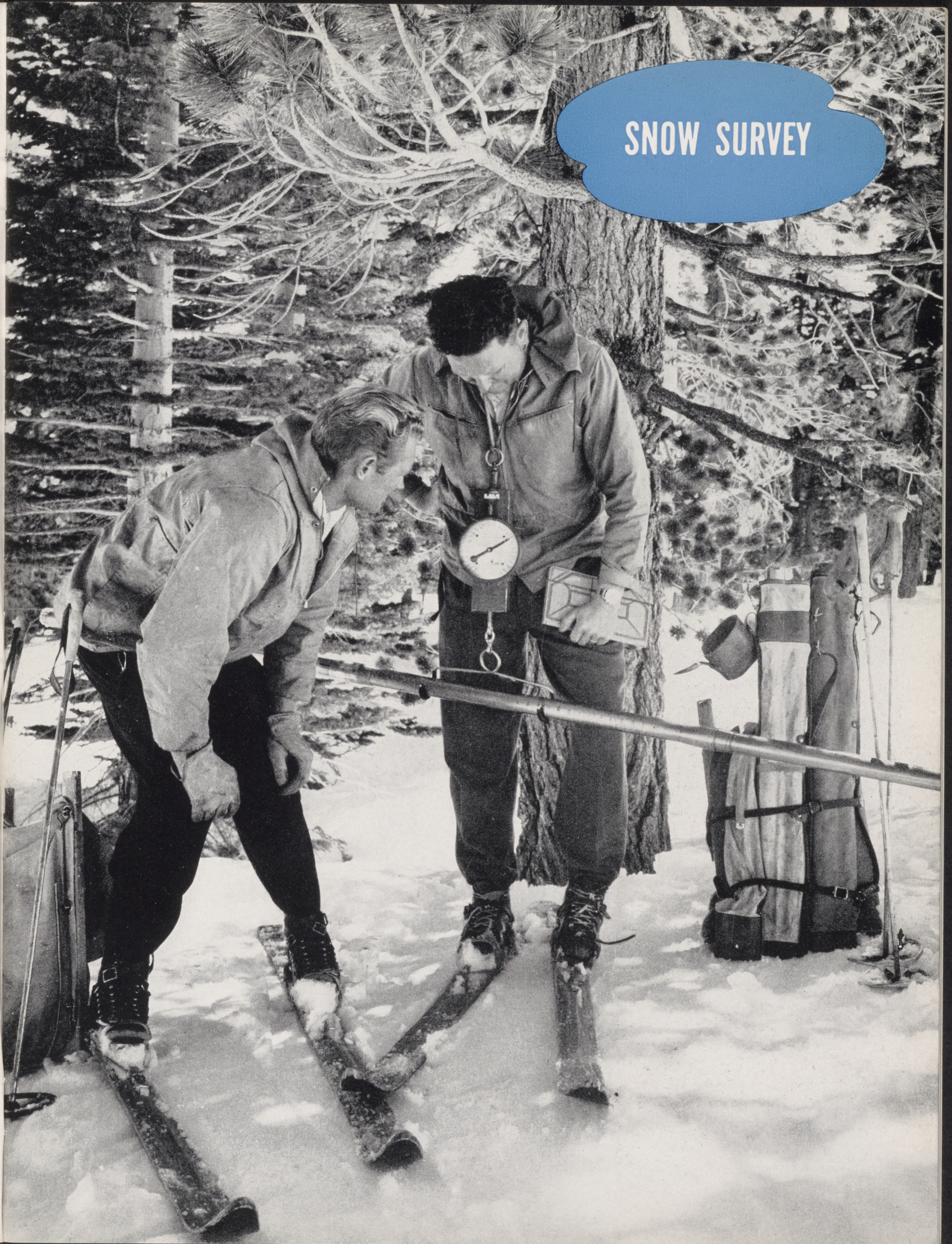
PUMPING OPERATIONS

Although the Los Angeles Aqueduct brings the waters of the Owens River from far-off Inyo County entirely by gravity flow, considerable pumping operations are necessary within the City to deliver supplies to the mountain areas and to maintain adequate pressures in some of the level areas.

Total output of pumping operations for the last fiscal year was 55,970,727,000 gallons, an increase of 3.4 per cent over the previous twelve-months period. Of this amount, 28,372,374,000 gallons were produced by groundwater plants. The increase in groundwater pumping over the previous year was 6.7 per cent.

Hydrographers determine water content of Sierra Nevada snow pack to forecast the annual runoff

SNOW SURVEY



There has been a marked decline in ground-water elevation in the San Fernando Valley, Harbor and Griffith Park areas. In the latter district, this is evidenced by a decrease of 8.4 per cent in the total output despite practically continuous operation of the Deep Gallery Pumping Plant as compared to 86 per cent operation during the previous year. Throughout the system, rehabilitation of some wells, and lowering of pumps in others, has been necessary.

PURITY OF SUPPLY

Purity of the water served to the people of Los Angeles is attested by the fact that not one case of water-borne disease has ever been traceable to the municipal supply. Pure at its source, Los Angeles water is surrounded by every safeguard to insure that it remains bacteriologically safe, and minerally and aesthetically acceptable for domestic consumption, in accordance with the highest public health standards.

No surface water is taken into the system from the Los Angeles River watershed. This supply is spread and percolates into the vast underground storage basin of the San Fernando Valley. There it filters through natural sand and gravel, later to be recovered in collecting galleries and by a series of deep wells.

The Aqueduct supply, fed from the melting snows of the High Sierra, travels through 238 miles of Aqueduct. Its dissolved oxygen or "air" content at all times keeps the water sparkling and palatable. The design of the local distribution system prevents stagnant zones. Occasional turbidity, caused by reversal of water flow in the mains when sudden, sharp increases in water use occur, is quickly eliminated by flushing. Constant vigilance over all local watersheds protects the purity of the supply in production and storage. As a precautionary measure, the supply is treated by application of chlorine as required. Photo-electric tubes automatically control addition of the exact amount of chlorine required, the "dose" averaging less than five pounds per million gallons. Living to the age of 80, and drinking a quart of water daily, one would consume no more chlorine than the amount that is contained in one-half teaspoon of common table salt.

The Sanitary Engineering division of the Municipal Water System made more than 50,000 laboratory and field analyses during the year. Of these, 28,633 were for bacteriological control and the remainder for mineral, sanitary, chemical and microscopic examination. Analyses are made daily, not only of water delivered at consumers' taps, but also of water from all sources and inlets to reservoirs, so that every possible water carrying and storage medium is carefully watched.

SUPPLIES AND SERVICE

The Water Stores Section, during the year, had receipts of materials totaling \$3,749,285.35, and issues of \$2,928,897.81. End of the year inventory was \$1,702,126.09, compared to \$881,738.55 in materials on hand at the close of the previous fiscal year.

The Salvage Section had receipts of \$69,276.84, of which sum the materials recovered and returned to the system, or disposed of to dealers, totaled \$67,305.90. Salvage materials balance at the year's end was \$32,126.64, compared to \$30,155.70 for the prior year.

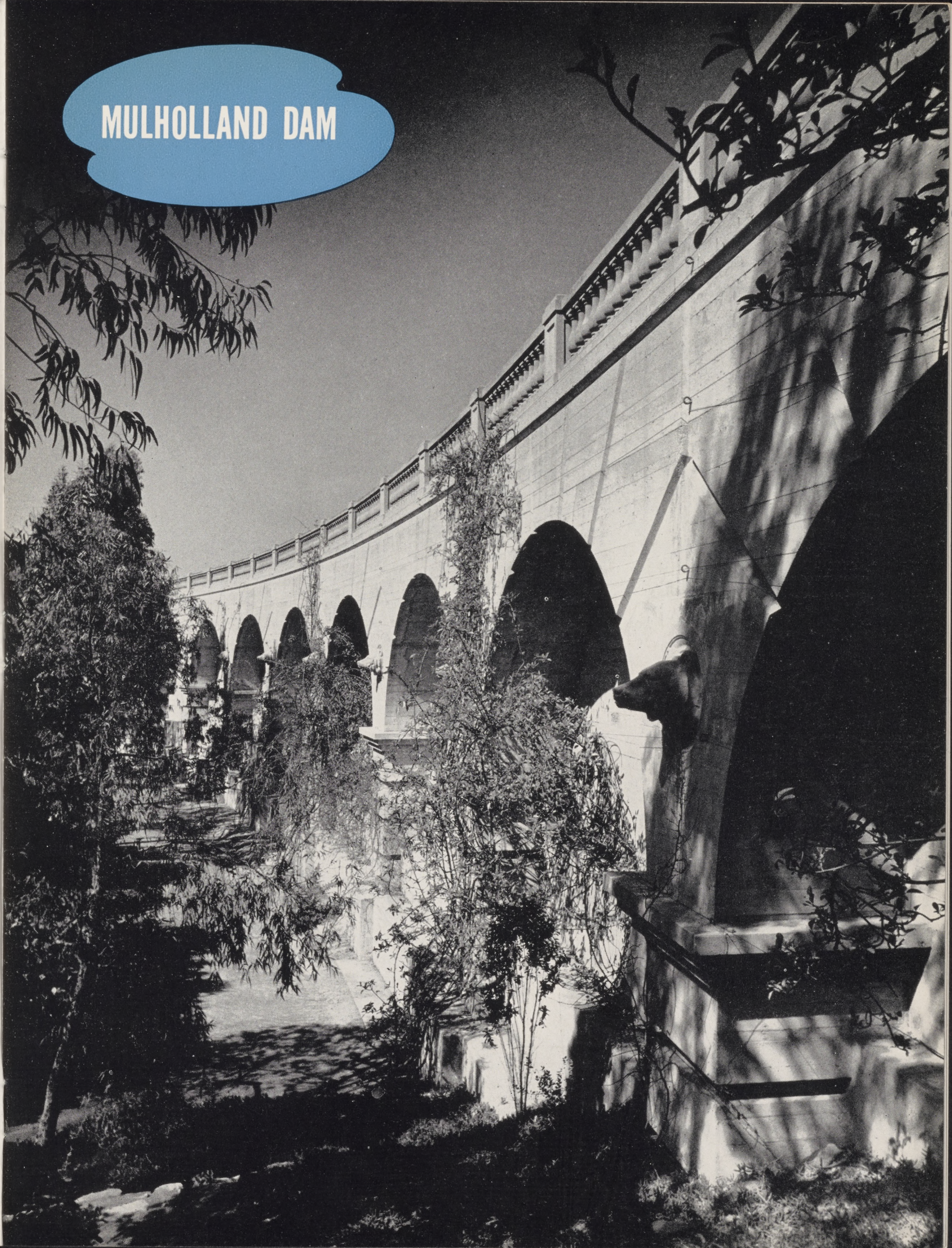
The Water System's transportation fleet comprised 205 passenger cars, 394 trucks, and 17 trailers, with 174 new units on order at the year's end. Shortage of transportation equipment and inability to secure deliveries from dealers made necessary the rental of 24 dump trucks, 18 flat stake trucks and five pickup trucks.

Total mileage of all passenger cars was 2,229,911, an average of 10,878 miles per car. Truck mileage totaled 3,613,460, an average of 9,171 miles per truck. Comparison with the preceding year shows increases of 16 per cent in passenger car and 11 per cent in truck mileage.

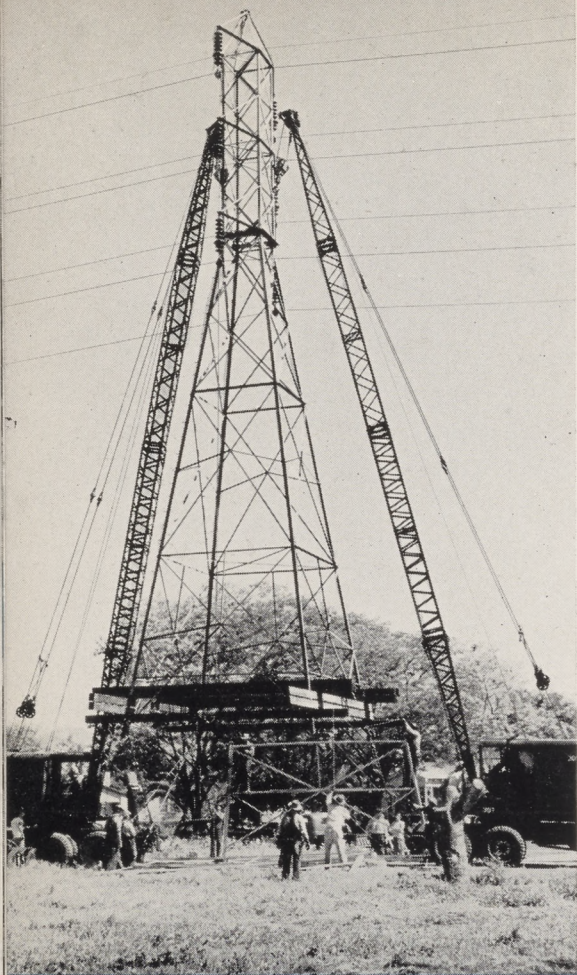
The number of active units of construction equipment in service at the end of the fiscal year was 349, with 50 new units purchased and 14 obsolete units retired. Thirty pieces of new equipment were on order at the year's end. Lack of adequate equipment and deferred deliveries of equipment on order necessitated rental of 115 units of various types for varying periods of time. Aggregate operating time for all units was 178,509 hours, approximately 25 per cent more than the operating time for the prior year.

One of the Water System's close in storage units, Hollywood Dam creates reservoir of 4000 acre feet

MULHOLLAND DAM



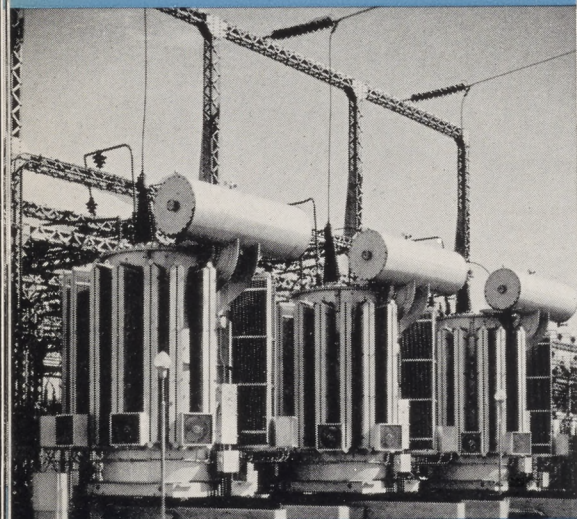
Power Operations



Moving a transmission tower intact to new site



Hoover turbine runner on way to city for repair



Power transformer bank at a receiving station

Below average runoff of the Colorado River into Lake Mead, with storage already low from the previous year; the increased use of Hoover Dam power by other allottees; and restrictions imposed by requirements of downstream irrigation, resulted in the lowest availability of electrical energy from this source since the beginning of Hoover Dam Power Plant operation. Because of its high efficiency, the Harbor Steam Plant was used whenever possible for base load.

Total energy generated, purchased, and received for redelivery by the Municipal Power System was 4,011,201,493 kilowatt hours. This represents an increase of 14.20 per cent over the previous twelve-month period.

Hoover Dam Power Plant continued to be the chief source of energy, accounting for 60.18 per cent of the total. Power from this source, however, was 15.35 per cent less than the year previous.

Hydro generation of Aqueduct plants in the metropolitan area contributed 8.85 per cent, an increase of 7.03 per cent, while Aqueduct plants in the Owens Valley area accounted for 2.54 per cent, output of these sources being increased 11.70 per cent.

Energy generated in all steam plants totaled 921,446,870 kilowatt hours, or 22.97 per cent, compared with 203,681,860 kilowatt hours, representing 5.8 per cent, the previous year.

Energy purchased and received for redelivery was 5.46 per cent of the year's total.

DISPOSITION OF ENERGY

Sales to ultimate consumers totaled 2,736,145,816 kilowatt hours, representing 68.21 per cent of energy handled, an increase of 6.83 per cent over the previous fiscal year. Other sales, including those to utilities, amounted to 323,165,235 kilowatt hours, or 8.06 per cent. Interchange deliveries, deliveries to municipalities and direct deliveries from Hoover Power Plant amounted to 396,684,410 kilowatt hours, or 9.89 per cent of the total. Use by the Department for operation of its own facilities, and total losses, amounted to 555,206,032 kilowatt hours, or 13.84 per cent, an increase of 9.53 per cent.

Average number of Power System active accounts for the year was 590,098, of which 588,131 were served in the Los Angeles area, and 1,967 in Owens Valley.

Within the City system proper, domestic customers increased by 8,476 to 480,389, up 1.6 per cent in number and 11.1 per cent in kilowatt hours used. Average use for the year increased from 1,321 to 1,445 kilowatt hours per customer.

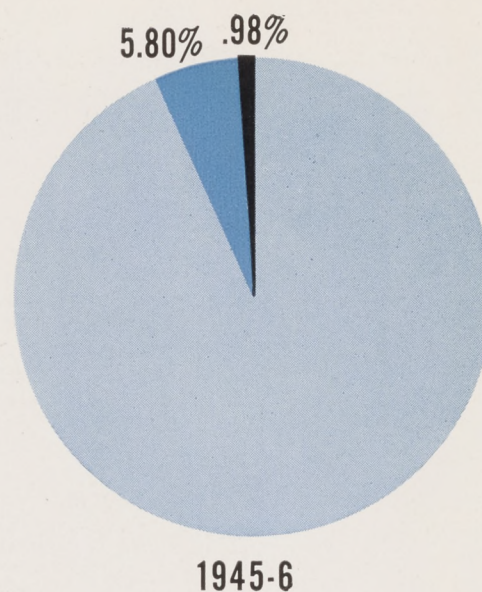
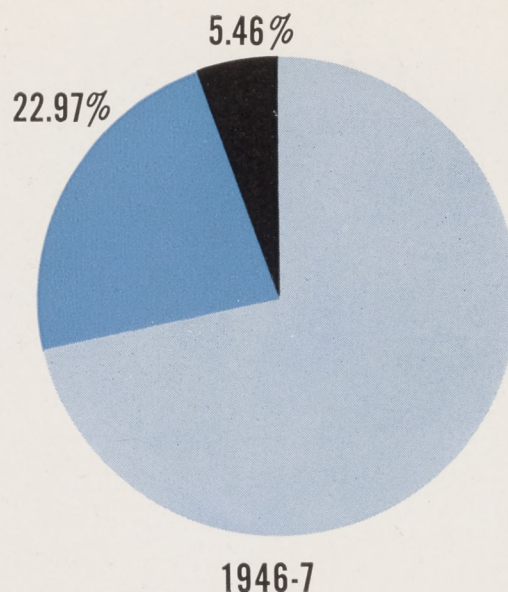
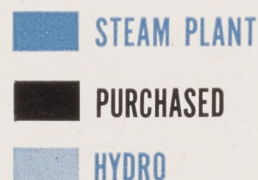
Commercial customers increased 5,919 to 98,919, up 6.4 per cent in number and 11.6 per cent in kilowatt hours used.

Helicopter is tried on experimental basis for inspection of high voltage transmission lines

LINE PATROL



Sources of Electrical Energy



Average number of industrial accounts increased by 718, bringing the total number to 7,642. While the number of customers increased by 10.2 per cent, energy used was 3.5 per cent below the preceding year, reflecting return to single shift plant operation and material shortage, especially of sheet steel, estimated by the State Chamber of Commerce to have curtailed machine capacity from 10 to 75 per cent in 22 per cent of the manufacturing plants in Southern California.

Total amount of new business added to the lines during the year represents an estimated annual gross revenue of \$3,129,818.

Residential building permit notices sent to field representatives numbered 14,655, of which 3,550 were for multiple housing, and represent 7,539 dwelling units.

Because of a critical shortage, approximately 6,000 residential services had been connected without meters by the close of the year. Due to delays in delivery of larger capacity transformers, use of existing facilities was extended, and many transformers were relocated.

SYSTEM FACILITIES

There were no additions to generating resources during the year, normal output capability of the Municipal Power System remaining at 767,000 kilowatts. Of this amount, 410,000 kw are at Hoover Dam Power Plant, 252,000 kw in local steam plants, and 100,000 kw in hydro plants on the Aqueduct. Six operating hydro-electric plants are maintained in the Owens Valley area, with a total installed capacity of 18,300

kilowatts, of which 5,000 are available for local load. Included are Bishop, Lone Pine, Independence and Big Pine, where distribution systems were acquired in connection with the Department's water and power development program.

Total circuit mileage of the overhead electric transmission and belt line system at the close of the year was 1,009.88 miles. This includes 749.74 tower miles of steel tower lines supporting three Boulder transmission circuits, averaging 263.53 miles in length, or a total of 790.6 circuit miles transmitting energy at 287,500 volts; 71.58 circuit miles of 138,000 volt overhead belt and tributary lines within the distribution area and 147.7 circuit miles of 115,000 volt overhead lines. The circuit length of the Los Angeles area sub-transmission and distribution lines on wood poles, including voltages ranging from 2,300 to 66,000 volts, is 4,418.2 miles. The system includes 2,432.98 miles of underground electric cable. This is made up of 18.27 circuit miles of 138,000 volt and 114.93 circuit miles of 34,500 volt cable; 523.81 miles of 4,800, 4,000, and 2,300 volt primary, 1,775.97 miles of 480, 240 and 120 volt secondary and service lines.

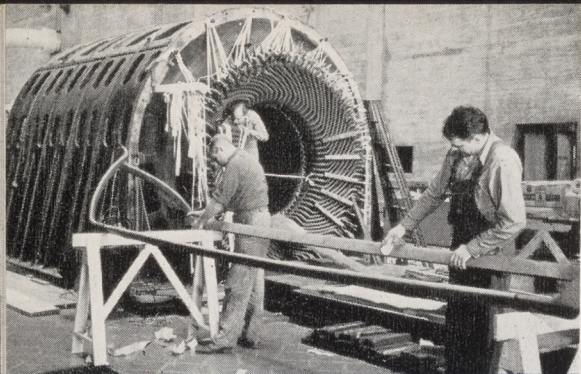
There are six Receiving Stations with a total transformer capacity to the 34,500 volt receiving station buses of 928,750 kilovolt-amperes, with an additional 83,500 kilovolt-amperes of transformer capacity direct from power plant to the 34,500 volt distribution system.

Total installed capacity of distribution and industrial station transformers is 1,210,672 kilovolt-amperes within the Los Angeles area, served through 41 permanent attended and 33 unattended temporary and supervisory distribution stations and 248 industrial stations.

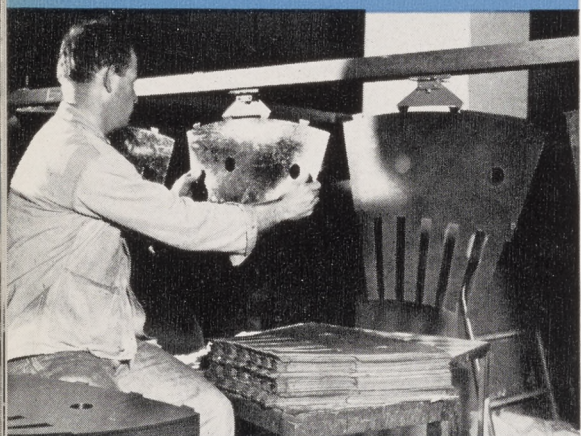


RECEIVING STATION

DANGER
HIGH VOLTAGE



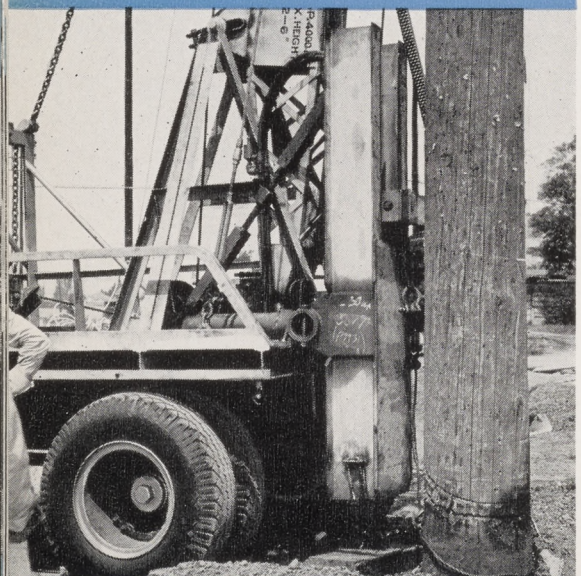
Stator winding repairs on 37,500 kva generator



A production line revarnishes lamination sheets



Truck powered earth boring machine in operation



New type pole puller was designed by Department

MAINTENANCE

The Maintenance, Repair and Shops Sections continued the long established policy of preventive maintenance by periodic inspection and overhaul of steam and hydraulic prime movers, generators, synchronous condensers, and other system equipment. Advantage was taken of every opportunity to check machines and to anticipate repairs before breakdown occurred.

A typical major repair job, one of the largest of its type ever performed by Department personnel, followed the failure of a 37,500 kva steam generator at the Seal Beach Steam Plant, due to a breakdown of insulation on clamping bolts passing through stator iron laminations. Earliest delivery that could be promised by manufacturer was 26 weeks for new coils and 53 weeks for stator iron.

The machine was restored through rebuilding the old parts. Removal of all coils and laminations was necessary. An endless chain conveyor system was designed and built for reinsulation of the iron, and 85,000 individual sheets were painted and baked in a bank of infra-red lamps, in a period of seventeen days. Reinsulation of a considerable portion of all coils was necessary. While this work progressed, the steam turbine was dismantled and overhauled. Steam leakage past the stationary blades was eliminated. The unit was back in service in less than four months.

At Hoover Power Plant, Department forces completely dismantled the 115,000 horsepower hydraulic turbine and the 82,500 kilowatt electric generator of Unit N-3 for a major overhaul, after approximately eleven years of service. The job involved removal and repair of crown plate, thrust collar, wicket gates, turbine runners and pressure regulator. At the same time the exciter, guide bearings and thrust bearing were dismantled and repaired. Relatively minor repairs were made to seven other units of similar capacity, and to two smaller capacity house units.

SUPPLIES AND SERVICE

The Power System Stores Section, during the year, had receipts of materials totaling \$9,635,325, and issues of \$8,958,644. End of the year inventory was \$4,504,378, compared to \$3,855,433 at the close of the previous fiscal year. Salvage material valued at \$155,328 was accumulated, with value of materials recovered and returned to the system or sold to dealers, reaching \$162,883.

The transportation fleet of 860 units was increased to 950 by the end of the year, through purchase of 125 new units, 35 of which were replacements and 90 were additions. The fleet includes 600 trucks, 347 passenger automobiles, and three motorcycles.

Mileage traveled by the fleet totaled 8,063,635, an increase of 13.8 per cent over the previous year. Of this total, 4,342,713 miles were traveled by trucks, and 3,720,922 by passenger vehicles. Freight transported by the pool fleet was 85,124 tons, an increase of approximately 26.5 per cent.

The construction equipment fleet, numbering 315 units at the beginning of the year, was increased to 323 units at its close. Construction equipment operated a total of 148,203 hours.

Purchasing

The Purchasing Agent's Office established a record high volume. Purchase orders and contracts awarded numbered 19,558, involving contingent liabilities of \$30,698,423. This represents an increase over the previous fiscal year of 4,202 orders, and \$10,595,000 in value of commodities purchased.

Outstanding among the individual major purchases were three 75,000 kilowatt steam generator units for the Harbor Steam Plant, for \$2,064,586, and a contract for power and signal cables at a price of \$1,066,566.

Cost of six commodities used by the Department exceeded the million dollar mark. They were: Pipe, pipe fittings, valves, etc., \$3,722,850; chemicals, acids, oil, gasoline, lubricants and resinous products, paints and glass, \$1,803,849; transformers, regulators and parts, \$1,778,654; buildings, building repairing, re-roofing, painting, etc., \$1,557,662; wire and cable, \$1,303,375; condensers, \$1,258,447.

Miscellaneous Facts

Regular bills tendered customers numbered 5,236,756, with an additional 139,147 billings in closing accounts.

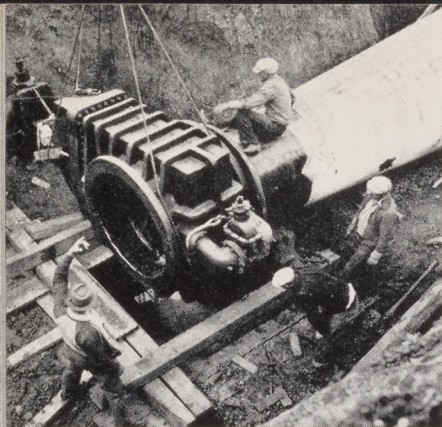
With total combined Water and Power sales, exclusive of Owens Valley, \$62,052,497.35, writeoff to uncollectible accounts amounted to \$29,659.37—.04780 per cent.

Commercial offices made 56,229 service investigations and adjustments—10,167 water, 42,111 electric, and 3,951 miscellaneous.

Installation of 61 miles of water mains raised the city's total to 4,427 miles.

While the average home used 9.4 per cent more electricity, the average billing per kilowatt hour decreased 4.1 per cent.

Budgeted for construction of system extensions and betterments for the next fiscal year is \$12,297,000 for the Water and \$35,861,000 for the Power System.



Installing valve in major trunk line

Construction...Water

While somewhat hampered and delayed by shortages of trained manpower and of materials, and by inability to secure early deliveries on essential equipment, the close of the fiscal year saw the Water System's seven-year \$35,000,000 program of system additions and betterments well under way. Engineering design is being pushed to completion as rapidly as possible on a group of major projects.

Construction has been started on the new Baldwin Hills dam and reservoir, designed to regulate pressures in the southern area of the city. The new water storage facility, with 49,400 feet of 58-inch inlet main, 38,000 feet of 66-, 60- and 54-inch outlet main, chlorinating plant and other appurtenances, will cost an estimated \$6,200,000. The dam, rising to a height of 155 feet at its axis, will be 66 feet wide at the top and 650 feet long, and will contain 700,000 yards of compacted earth. A 30-foot road will cross the dam and circle the reservoir, which will form a lake 18 acres in area, with a storage capacity of 900 acre feet. Completion is scheduled for late 1949.

Engineering design is practically complete and bid proposals will shortly be invited for construction of the River Supply Conduit extension, scheduled to start early in 1948. This project will connect the existing 66-inch River Supply conduit to the North Hollywood Pumping Plant. It will require installation of 10,400 feet of 66-inch, 24,200 feet of 51-inch, and 6,600 feet of 45-inch reinforced pipe, with appurtenances, at an estimated cost of \$1,400,000. Completion, scheduled for the spring of 1949, will make Aqueduct water available to Silver Lake Reservoir. Completion of projected wells in the San Fernando Valley area, coupled with the conduit extension, will provide full regulation of the Aqueduct flow.

Construction of the new Water System Western District headquarters was begun in March, with completion scheduled for November, 1947. The new yards, to cost \$308,000, will include office and warehouse building, and two structures for housing automotive equipment. Grounds are attractively landscaped. The new headquarters are much larger and more centrally situated than the former location.

Improvements to the Aqueduct, to cost an estimated \$1,302,000, are progressing, with 3,203 linear feet of conduit cover reinforcement completed, including 90 patrol road and drainage crossings. In addition, 1,464 linear feet of old conduit cover is ready for placing of concrete, and another 6,309 feet have been cleaned, preparatory to setting steel for similar

rebuilding. Reinforcement of siphon and tunnel sections has been started, and the regular maintenance work, which includes such operations as scaling, washing, sandblasting and guniting open canal linings has been progressed during Aqueduct shutoffs.

Dead-end streets, grade separations and wide rights-of-way resulting from the City's program of Freeway construction required considerable relocation and new construction of water works facilities, in close coordination with highway construction. Removal of some one and one-half miles of pipe, ranging in size from four to 24 inches, with redesign and new installations, and relocation of fire hydrants in the areas, were involved in the sections of the Santa Ana and Hollywood Freeways under construction during the year.

Engineering design is near completion for the Stone Canyon Reservoir project, to cost an estimated \$4,170,000. Plans call for a new upper reservoir and dam with a capacity of 189 acre feet, 12,500 feet of 42-inch connecting main to Franklin reservoir, 7,830 feet of 60-inch and 51-inch bypass line, and reconstruction and raising of the existing Lower Stone Canyon Dam and Reservoir to increase storage capacity from the present 8,000 to 9,200 acre feet. The project will provide higher pressures and improved regulation in the City's Westgate and Palisades areas, and furnish added storm water protection.

Early start of construction is planned on a new connecting line between the Metropolitan Water District system in Eagle Rock and Hollywood Reservoir. Population growth and industrial expansion make it necessary to prepare for early increased utilization of Colorado River water, to supplement the High Sierra and Los Angeles River sources.

Engineering studies were progressed on the City Trunk Line project, which will involve cement lining and reconstruction of 38,000 feet of 62-inch and 72-inch mains, and construction of 8,000 feet of additional new 72-inch main.

Well along in engineering is the Dry Canyon Reservoir project, which contemplates construction of a bypass conduit around the reservoir, and improvements to the dam and spillway to afford protection from storm waters and to insure continuous delivery of Aqueduct water through periods of heavy rain.

Laying water main under bed of Los Angeles River



Initial phase of construction work under way on new Baldwin Hills Reservoir



Construction...Power

Several important projects in the Power System's \$154,000,000 seven-year program of additions and betterments were under way as the fiscal year ended. Some were in various stages of construction and others were well advanced in engineering design. Progress has been retarded because of shortages of skilled workmen and of materials, and the longer than normal time required by manufacturers to deliver needed equipment.

With only the addition of Unit No. 1, a 65,000 kilowatt steam turbine generator at the Harbor Steam Plant, to augment generating facilities which existed in 1941, work has been rushed upon installation of Unit No. 2, also of 65,000 kilowatts capacity. It now appears certain that the new unit will be in operation in time to carry its share of the 1947 winter peak load, which is expected to reach an all-time high.

Ever increasing electric demands have advanced the original schedule for development of the Harbor plant to its ultimate capacity. Engineering design has been completed on all major equipment for Units Nos. 3, 4 and 5, each of 75,000 kilowatts capacity. Contracts have been awarded for approximately 60 per cent of the required equipment, and bids have been called for on an additional 20 per cent.

Construction work has commenced and is progressing in a satisfactory manner. All excavation and sub-structure work has been completed, and it is expected that two units will be placed in service by the fall of 1948, with the third unit ready for operation by the following spring. The \$40,000,000 project then will have a capacity of 355,000 kilowatts, approximately three-fourths the total energy available to Los Angeles from Hoover Dam. It will be the second largest steam generating plant west of Chicago.

On June 26, 1947, the Board of Water and Power Commissioners authorized immediate development of hydro-electric power resources along the Owens River Gorge at a total estimated cost of \$40,526,000. In view of the fact that delivery dates for heavy electrical equipment are much longer than in previous years, engineers are to proceed immediately with design and construction of the Gorge project.

Three identical hydro-electric power plants will be built to utilize the 2,375-foot drop in elevation from Crowley Lake to the end of the Gorge. Each plant will contain a single turbo-generator of 37,500 kilowatts capacity. Plants will be located so as to divide the power drop into three approximately equal heads. Power will be delivered to Los Angeles over a 230,000 volt transmission line. Extending from the Gorge to Receiving Station E in San Fernando Valley, the line will be about 230 miles in length. When the proposed plant is completed, it is estimated that its operation will save 1,250,000 barrels of fuel oil annually, which would be needed for an equal amount of steam generation.

Other construction phases include raising the height of Long Valley Dam by 20 feet, which will increase water storage capacity of Crowley Lake from 183,000 to 315,000 acre feet. Approximately 58,000 feet of concrete lined tunnel will be needed to deliver water from Crowley Lake to the three power plants. Fabrication of penstocks to carry the water to hydraulic turbines will require 18,534 feet of 8-foot diameter steel pipe. Small diversion dams will be erected below each power plant for water regulation.



The loop transmission system was placed in operation with completion of one circuit between Receiving Stations B and D. It consists of two $3\frac{1}{2}$ mile overhead steel tower sections and a $5\frac{1}{2}$ mile underground cable section, operating at 132,000 volts. The B to D section is the final link in a comprehensive loop line system which now encircles the central portion of the city. It increases the Boulder transmission line capability by 40,000 kilowatts; improves reliability of service in areas served by Receiving Stations B, D and E, and makes possible delivery of electric energy from either of two major generating sources.

Most important receiving station job progressed through the year was modernization and expansion of facilities at Receiving Station F. Engineering design is well advanced on the installation of two 40,000 kva synchronous condensers, a new control house, a third 132/34.5 kv transformer bank and appurtenant equipment. Engineering design was started on the addition of a third 60,000 kva transformer bank at Receiving Station D.

First new distributing station to be commenced since prior to the war, construction was under way on Distributing Station No. 49, 4276 Coldwater Canyon Avenue. Of reinforced concrete construction, the building will be one story in height, with a partial basement. Total cost is estimated at \$647,000. The station is designed for an ultimate capacity of six 34.5 kv underground lines; seventeen 5000 volt underground regulated feeders; one 15,000 and one 10,000 kva transformer banks, and four street light feeders. It eventually will be operated by supervisory control from Receiving Station E.

Plans are nearly completed for new Distributing Station No. 28, 11170 Nebraska Avenue. It will be one of the largest stations in the system and total cost will approximate \$1,000,000. Built of reinforced concrete, the building will be two stories in height, with a full basement. The station is designed for ten 34,500 volt lines; two 20,000 kva transformer banks; twenty-eight 4800 volt feeder positions; two 5000 kva synchronous condenser positions; eight street light circuit positions, and provisions for future carrier current street light control.

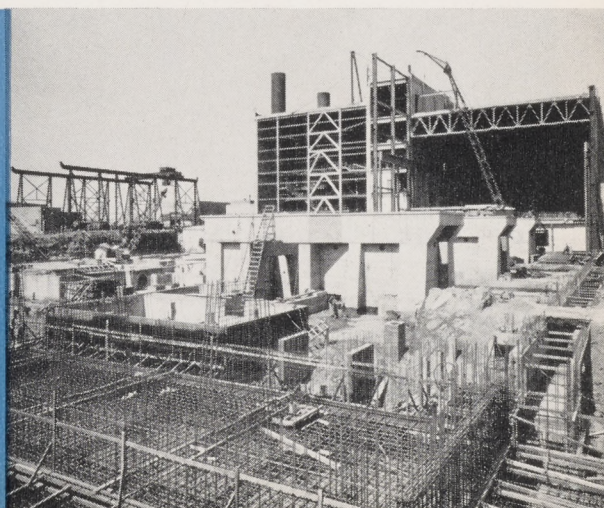
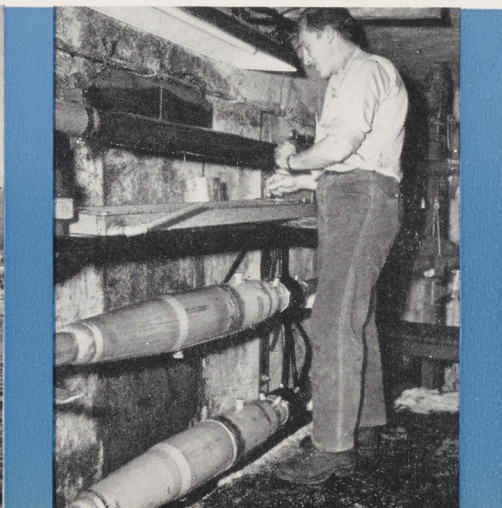
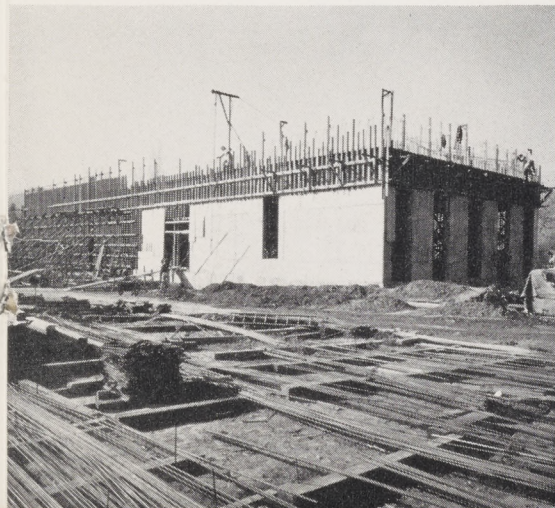
Work was started on expansion of Distributing Station No. 21, 6000 Van Nuys Boulevard, to provide an additional 15,000 kva transformer bank and four more regulated underground feeder positions. Engineering design was completed for enlarging Distributing Station No. 24 in Reseda. All breakers at this location will be operated through supervisory control from Distributing Station No. 21.

Other construction work included extensions to overhead and underground 34.5 kv systems and the overhead and underground low voltage systems to take care of new and increased demands from residential, commercial and industrial consumers.

First postwar distributing station under way

132 kv underground installation

Construction progress on Harbor Steam Plant expansion

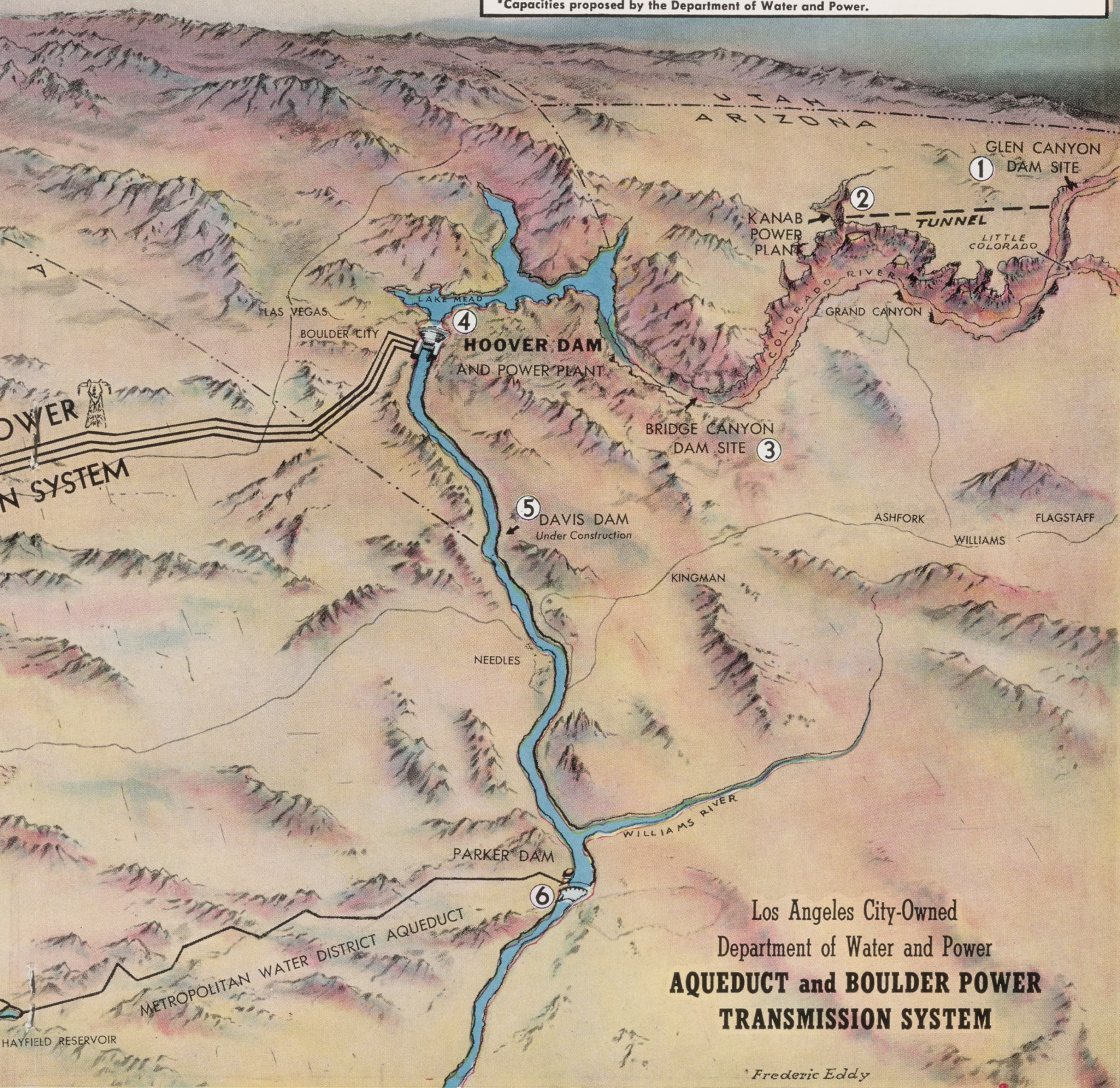




COLORADO RIVER POWER PROJECTS AVAILABLE TO THE SOUTHWEST

| PROJECT | RESERVOIR CAPACITY ACRE FEET | ULTIMATE POWER CAPACITY KILOWATTS |
|---|------------------------------------|--|
| 1. Glen Canyon (Planned) | 25,000,000 | 655,000* |
| 2. Kanab (Planned) | ----- | 1,100,000 |
| 3. Bridge Canyon (Planned) | 3,720,000 | 880,000* |
| 4. Boulder (Constructed) | 32,359,000 | 1,317,500 |
| 5. Davis (Under Construction) | 1,940,000 | 225,000 |
| 6. Parker (Constructed) | 716,000 | 120,000 |

*Capacities proposed by the Department of Water and Power.



Los Angeles City-Owned
Department of Water and Power
**AQUEDUCT and BOULDER POWER
TRANSMISSION SYSTEM**

*Frederic Eddy

Rate Reductions

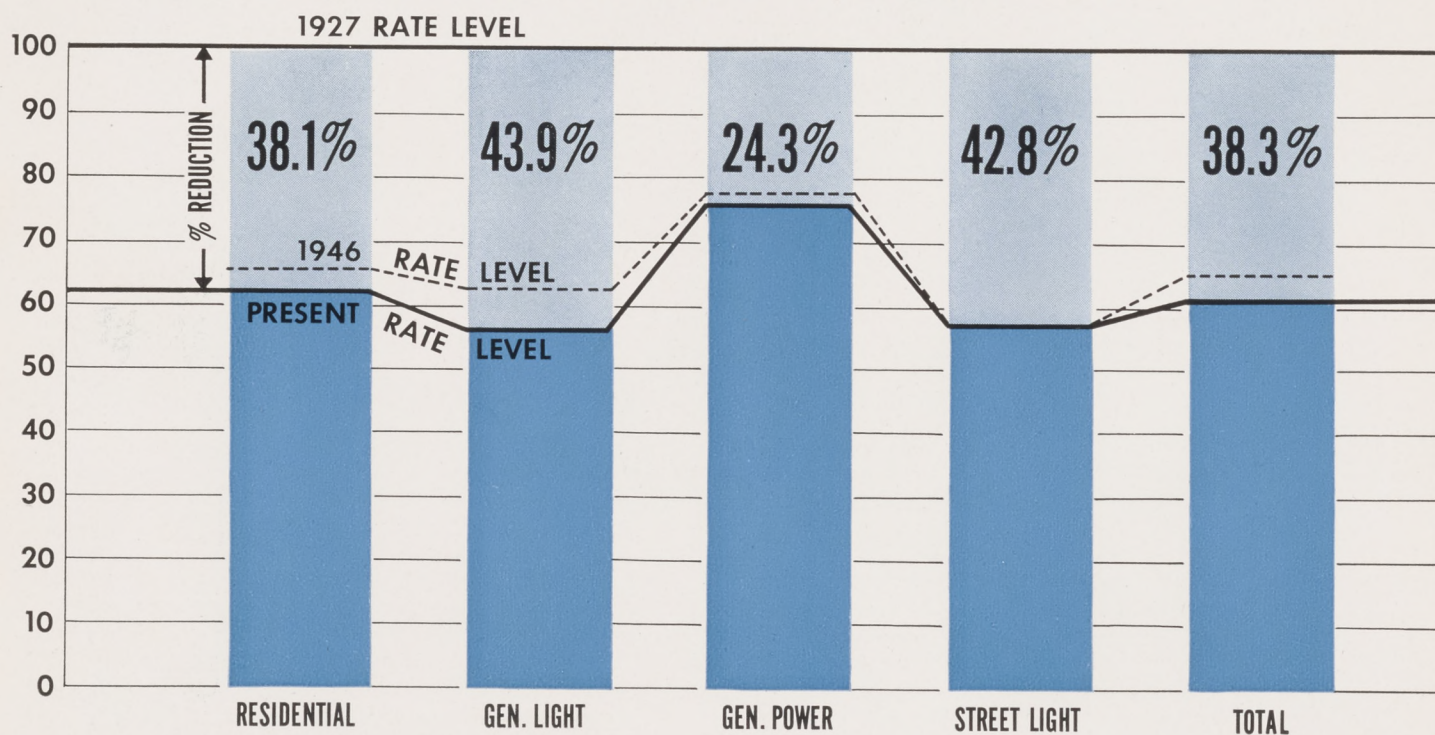
An adjustment in Residential Electric, General Lighting, and General Power Schedules, which went into effect at midyear, January 1, 1947, represents a new savings to customers of the Department's Power System of an estimated \$1,566,000 annually.

This rate decrease is a continuation of the Department's policy of carrying on constant studies of each class of rates, and of reviewing and refixing rates as often as justified, consistent with sound utility practice.

It is the twelfth cut in electric rates since August 1, 1927. Cumulative savings to homes, business and industry of Los Angeles through these successive reductions from that date to the end of the fiscal year on June 30, 1947, have been \$216,201,000.

The municipal Power System offers to industry the lowest general power rate schedule of any major industrial center in the United States. Rates for other classes of electric services, and water rates, are among the lowest in the country for comparable cities.

ELECTRIC RATE REDUCTION SINCE 1927



Monthly Rate Schedules—Water

DOMESTIC SERVICE APPLICABLE ALSO FOR COMMERCIAL AND INDUSTRIAL SERVICES

| CUBIC FEET | | PER 100 CUBIC FEET |
|------------|-----------------|--------------------|
| First | 3,300..... | 14.8¢ |
| Next | 30,000..... | 13.7 |
| Next | 66,700..... | 10.8 |
| Next | 200,000..... | 8.0 |
| Next | 300,000..... | 7.2 |
| Next | 1,400,000..... | 6.0 |
| Next | 2,000,000..... | 5.0 |
| Next | 6,000,000..... | 4.5 |
| Over | 10,000,000..... | 4.0 |

Minimum monthly charges range from \$1.10 for meters up to 1 inch to \$13.20 for 12-inch meter.

COMBINED IRRIGATION AND DOMESTIC SERVICE

| Gravity System, in excess of min..... 4.5¢ | | Pumped System, in excess of min..... 6.5¢ |
|--|---|--|
| DOMESTIC AREA, SQUARE FEET | MIN. MONTHLY CHARGE | CUBIC FEET SUPPLIED FOR MIN. CHARGE |
| First 12,500 | \$2.00 | 1,400 |
| 12,500 to 17,500 | 3.55 | 2,400 |
| 17,500 to 22,500 | 4.75 | 3,200 |
| Over 22,500 | 4.75 plus \$1.10 for each 5,000 sq. ft. or portion | 3,200 plus 800 for each 5000 sq. ft. or portion |

Monthly Rate Schedules—Power

DOMESTIC LIGHTING AND ELECTRIC APPLIANCE

In addition to a customer meter charge of 30 cents per month, rates for electricity vary as follows:

| KWH PER MONTH | PER KWH | KWH PER MONTH | PER KWH |
|---------------|---------|---------------|---------|
| First 45..... | 2.8¢ | Next 100..... | 1.5¢ |
| Next 55..... | 2.2 | Excess | 1.25 |

A lower rate is provided for Approved Electric Water Heating separately metered and with special conditions.

GENERAL LIGHTING

In addition to a customer meter charge of 30 cents per month, rates for electricity are:

| KWH PER MONTH | PER KWH | KWH PER MONTH | PER KWH |
|----------------|---------|-----------------|---------|
| First 100..... | 2.8¢ | Next 700..... | 2.2¢ |
| Next 200..... | 2.6 | Next 4,000..... | 1.7 |

Rates for consumption in excess of 5,000 kwh per month graduate downwards from 1.4¢ per kwh dependent on load factor. No minimum charge other than the customer charge except on service at 480 volts or higher.

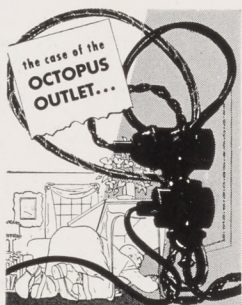
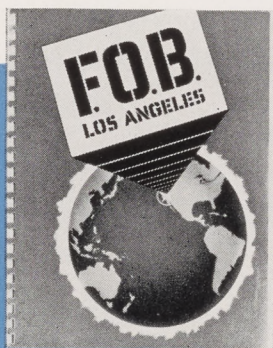
GENERAL POWER

Under conditions of less than average use of equipment (low load factor), rates vary from a maximum of 3.1¢ per kwh for the first 100 kwh per month to less than 1.0¢ per kwh for consumptions in excess of 10,000 kwh per month. Under conditions of better than average use of equipment (high load factor), the energy charges are even less. Minimum charges are nominal and ordinarily not more than 50¢ per horsepower but in no case less than \$1.50 per month.



A typical electric cooking demonstration

Sales Promotion



Poor Bill Jones... he once thought that wiring was wiring. He was so proud of his new house—until he realized that the convenience outlets were few and far between. That's why we find Bill arranging extension cords along the baseboard. His house will never be very convenient, though, and he'll have the sight of these "octopus" outlets. Someday he'll probably have the place rewired—and spend a lot more money than if he had insisted on Certified Adequate Wiring when the house was being built.

You'll never have to worry about octopus and how it gets so bad in your home. Get Certified Adequate Wiring. Please phone MCHS 4214, Station 201, or visit our Los Angeles City Owned Insurance Office at 1114 West 11th St. South Broadway, Los Angeles 12.

Electricity
CLEANER • SAFER • CHEAPER

While adhering to its established policy of not selling electric appliances in competition with dealers, the Department carried on a well integrated load building activity based upon cooperation with distributor and retailers.

Media used to reach consumers through a continuing program of advertising included metropolitan newspapers, outdoor posters, streetcar and bus cards, special folders and direct mail. Major appliances were displayed at all district and branch commercial offices. Prospects developed through these activities are referred to dealers.

Specialized advertising is used to reach dealers in all fields which include the handling of electrical appliances. Trained specialists advise on location and arrangement of stores, conduct training classes for sales personnel, and advise on merchandising methods. Home economists give electric appliance demonstrations in cooperation with school authorities, newspapers and organizations.

Sales promotion media include booklets, newspaper advertisements and billboards

Another *Electric* kitchen going in!

LOS ANGELES CITY-OWNED DEPARTMENT OF WATER AND POWER

Customer Services

A variety of services designed to assist customers of the Department in obtaining maximum benefits from use of electricity, were considerably expanded during the year as a result of the unprecedented building activity and industrial growth.

In the domestic field, a trained architectural staff designs kitchens on request, offering suggestions for efficient utilization of available space and use of modern, labor-saving devices. Complete "Adequate Wiring" plans are provided for home builders.

Commercial and industrial users of electricity are offered the services of experienced illumination engineers, who plan lighting for individual stores, offices or factories in new or existing buildings.

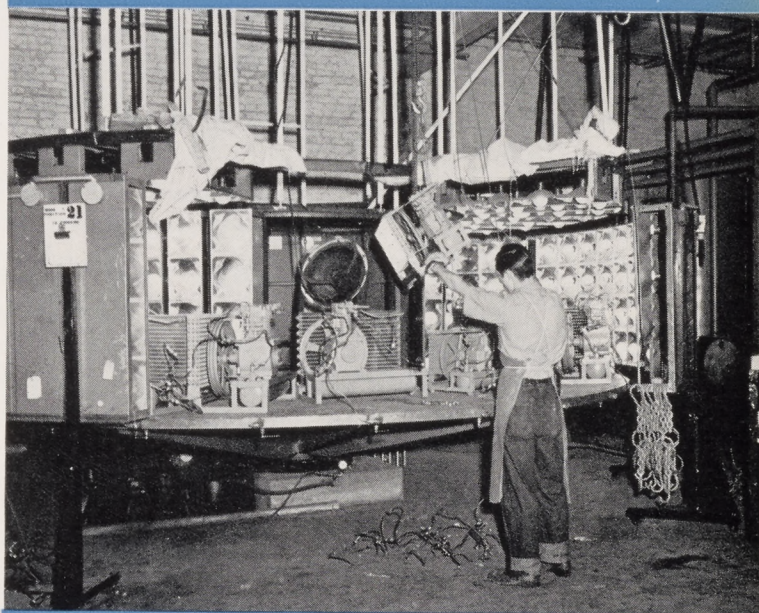
Engineering advice in the field of industrial heating is given to industrialists. Cooperation in planning processes for paint and enamel drying, heat-treating of metals, use of infra-red, high-frequency and resistance heat applications, is given.

Specialists in commercial cooking and baking work on kitchen layout and size and type of equipment for restaurants, cafeterias, and for hospitals and other institutions. Engineering service is provided on problems involving frequency, voltage, power factor and similar technical matters.

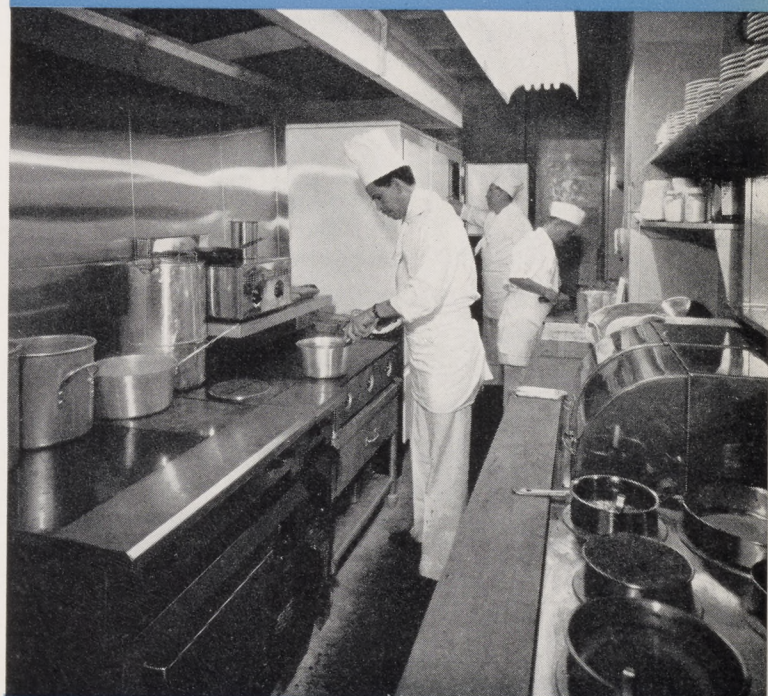
The Department's service engineering staff extends assistance to industry in locating factory floor space, new plant sites, industrial contractors, and machines and materials.



Illumination engineers aid in solving commercial lighting problems



Department engineers cooperate on industrial heating installations



Specialists help plan new all-electric kitchens for restaurants

Employee Retirement and Disability Fund

Active members numbered 8,166 at the close of the ninth fiscal year of operations of the Water and Power Employees Retirement, Disability and Death Benefit Plan. Six hundred and seventy-three retired employees were receiving retirement allowances.

Payments to retired employees during the 12 months totaled \$387,722.75. Another \$154,000 was paid in death benefits. Disability payments under the plan amounted to \$223,487.95, in addition to direct Department payment of \$469,849.07 in supplementary disability allowances.

The Plan's operations are directed by a Board of Administration, composed of two members of the Water and Power Commission, the General Manager and Chief Engineer, the Department's Chief Accounting Employee or Auditor, and three employee members elected for three-year terms by the active contributing members.

The Plan, a contributory one, is established on a sound, full reserve basis, with normal retirement age set at 65 for men and 60 for women. Under special conditions retirement may be granted at an earlier age, with lower pensions.

In-Service Training

The Department's apprenticeship program, operated in cooperation with the State Division of Apprentice Standards and the Los Angeles City Board of Education, is well under way and is constantly being expanded.

Apprenticeship courses already in progress include Cable Splicer, Caulker and Repairman, Conduitman, Electric Repairman, Electric Serviceman, Electric Tester and Lineman. Additional courses for Automotive Mechanic and Machinist are being organized.

Total class enrollment at the year's end was 267, which included 191 veterans, 12 of them disabled and in training under Public Law 16. Of the total, 209 of the employee apprentices are indentured and 58 are non-indentured.

An orientation program, designed to acquaint new employees with the history, organization, purposes and operations of the Department, has been set up and will be in operation shortly. Handbooks covering Department history, working rules, and Civil Service regulations, for distribution to all employees, are in preparation.

Reimbursement of tuition to employees successfully completing approved educational courses in colleges and universities was resumed, following Board authority in February.

Employee Activities

The Water and Power Employees' Credit Union, at the year's close, had a membership of 3,845 employees, with savings deposits of \$867,760. Outstanding loans to Credit Union members totaled 1,350 and aggregated \$338,826. Dividends are declared at the end of the fiscal year, based upon earnings.

Average number of employees purchasing United States Savings Bonds through the payroll deduction plan was 2,740, or 36 per cent of total personnel, with average monthly investment of \$71,000, or 3.17 per cent of the payroll. Since accredited as an issuing agency by the United States Treasury Department in February, 1942, the Credit Union has issued to employees 274,323 savings bonds, with a maturity value of \$12,200,000.

The Mutual Benefit Plan, operated by the Employees' Association, had a membership of 1,428, with a total in death protection of \$2,258,500. Benefits of \$34,500 were paid on 35 member deaths during the year.

The Employees Relief Fund, maintained to give financial aid without fee or interest charges in cases of serious illness or other extreme emergency faced by employees and their families, extended aid in 388 cases, and ended the year with 131 accounts outstanding, totaling \$29,856.07.

Outstanding social events were the annual picnic and barbecue for employees and their families in the Los Angeles, Owens Valley and Boulder City areas.

In its athletic program, the Association had 52 teams in a Department men's bowling leagues, and 20 teams in a mixed men and women's league. It was represented by 36 teams competing in the open events of the American Bowling Congress. Other activities included softball, volley ball, horseshoe and ping pong tournaments, golf, weight lifting, ocean fishing trips, and Camera club field trips and competitions.



Aqueduct Post national champion guard of honor



Scene at the picnic for Owens Valley employees



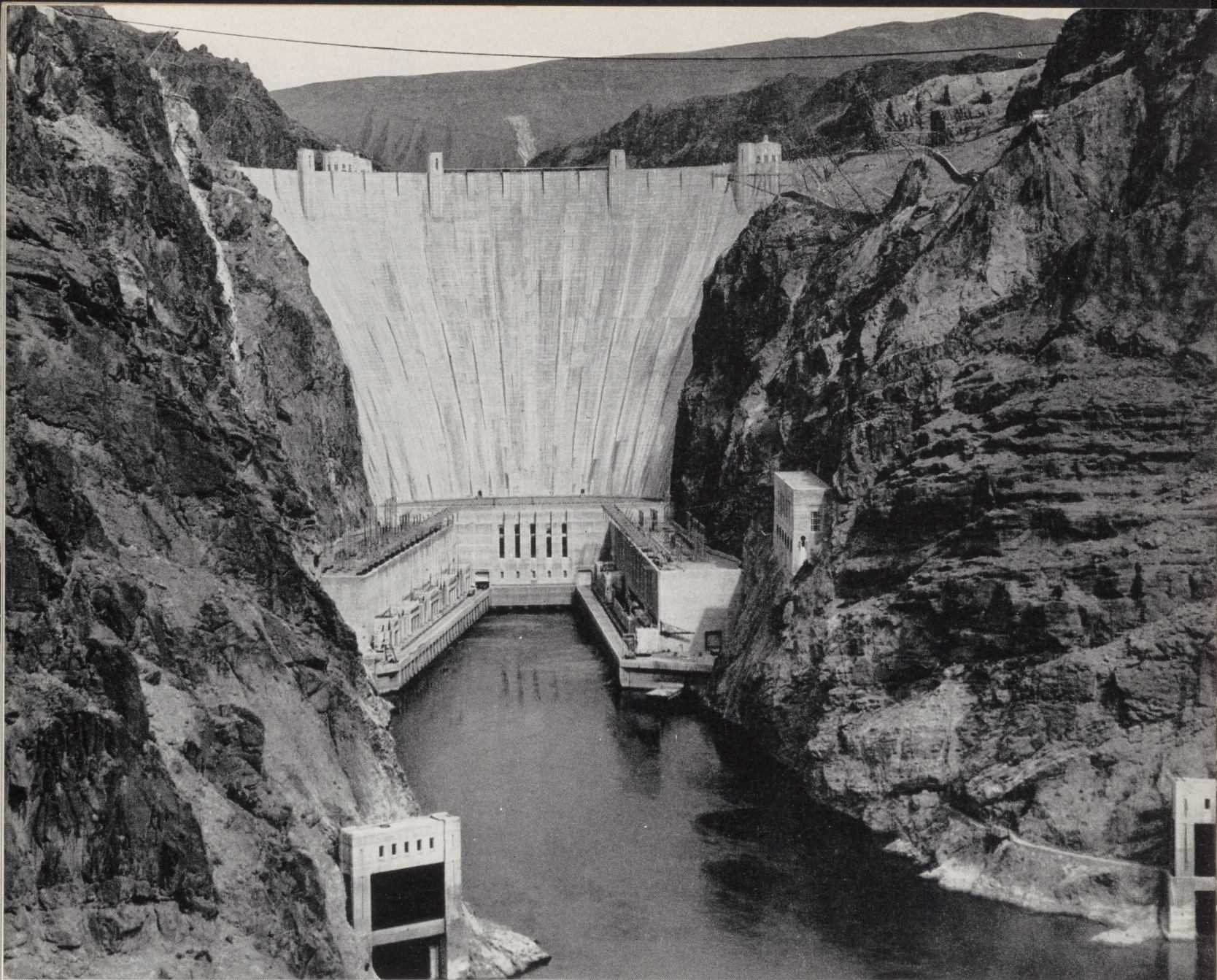
Trap shooting was popular Valley sports event



Athletic events provided fun for onlookers too

*Shown at bottom right are Boulder employees enjoying boat ride on Lake Mead, a picnic event
Over 13,000 employees and members of their families attended second annual Department picnic*





Hoover Dam and Power Plant

The Colorado River

Throughout the fiscal year, the Department of Water and Power, in cooperation with other Southern California agencies, continued its efforts to secure final settlement of the controversy over division of Colorado River water between the states of the Lower Basin, and to encourage early development of remaining hydro-electric potentials.

After 35 years of operation of the Los Angeles Aqueduct, population growth and industrial expansion have increased the city's water use to almost the full capacity of this source,

combined with the original Los Angeles River supply. Future growth is dependent upon the Colorado River, the community's last water hole, which has been serving many coastal cities through the Metropolitan Water District of Southern California since 1941.

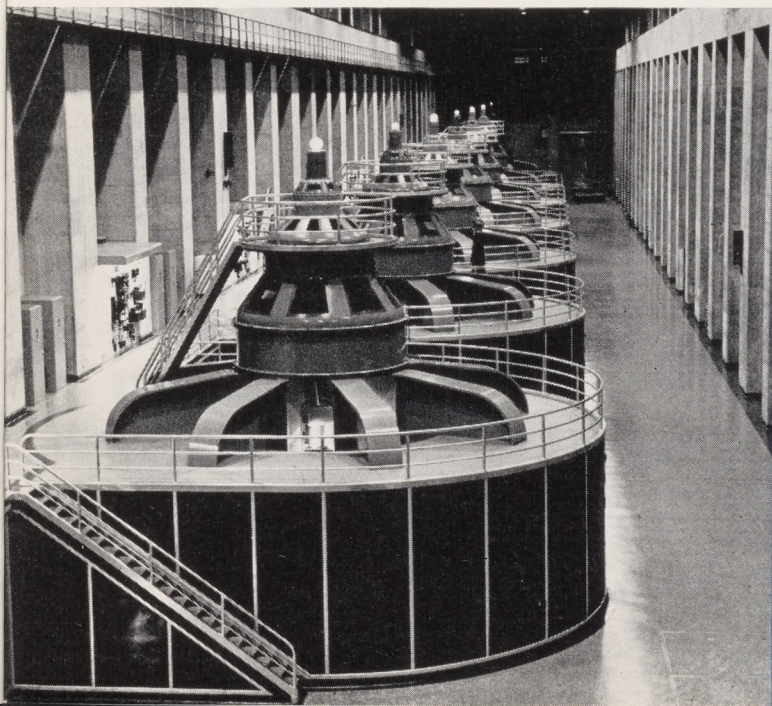
Efforts of the State of Arizona to secure a larger share of the waters of the Colorado have endangered the rights of Los Angeles and all of Southern California. The Department, with other Southern California agencies, is asking the United States Congress to adopt legislation which will permit final interpretation by the United States Supreme Court of the Colorado River Compact and other contracts and agreements allocating Lower Basin water. On the basis of these agreements, the Department and other California agencies have invested or committed a total of \$549,000,000 — investments which are placed in jeopardy by Arizona's claims.

The Department has maintained the position that no further Colorado River projects involving withdrawal of water from the Lower Basin should be authorized until the decision of the Nation's highest Court has finally determined the rights of the states.

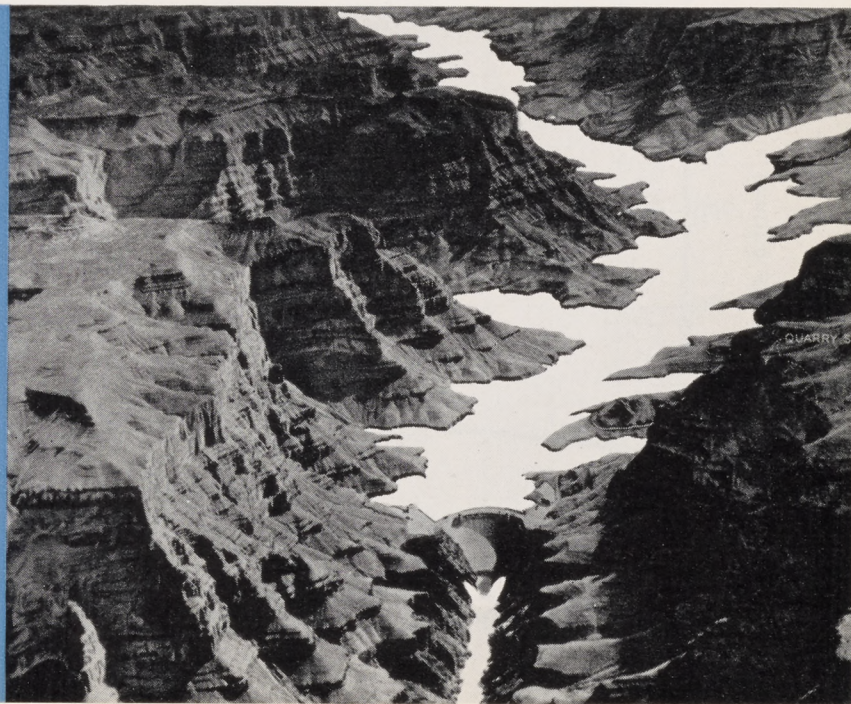
In the meantime, Department engineers are continuing cooperation with the Bureau of Reclamation in exploring dam sites, and in urging authorization by the Congress of development of hydro-electric power. A suitable site already has been determined at Bridge Canyon, and drilling is being carried on at Glen Canyon to locate a satisfactory location.

Power dams at Bridge Canyon and Glen Canyon, neither of which involve withdrawal of water from the river, and which were included in the original plans for development of the Colorado, are needed to supply the constantly expanding markets created by the population and industrial growth of all three Lower Basin states. The combined projects, which can duplicate the contribution of Hoover Dam to the economy of the Southwest, without cost to the government, will provide 1,535,000 kilowatts of generating capacity, and utilize water power equivalent to consumption of 15,000,000 barrels of fuel oil annually—energy that will flow on, forever wasted, until harnessed for the production of electricity.

Generator room in Nevada wing of Hoover power plant



Artist's conception of proposed power dam at Bridge Canyon

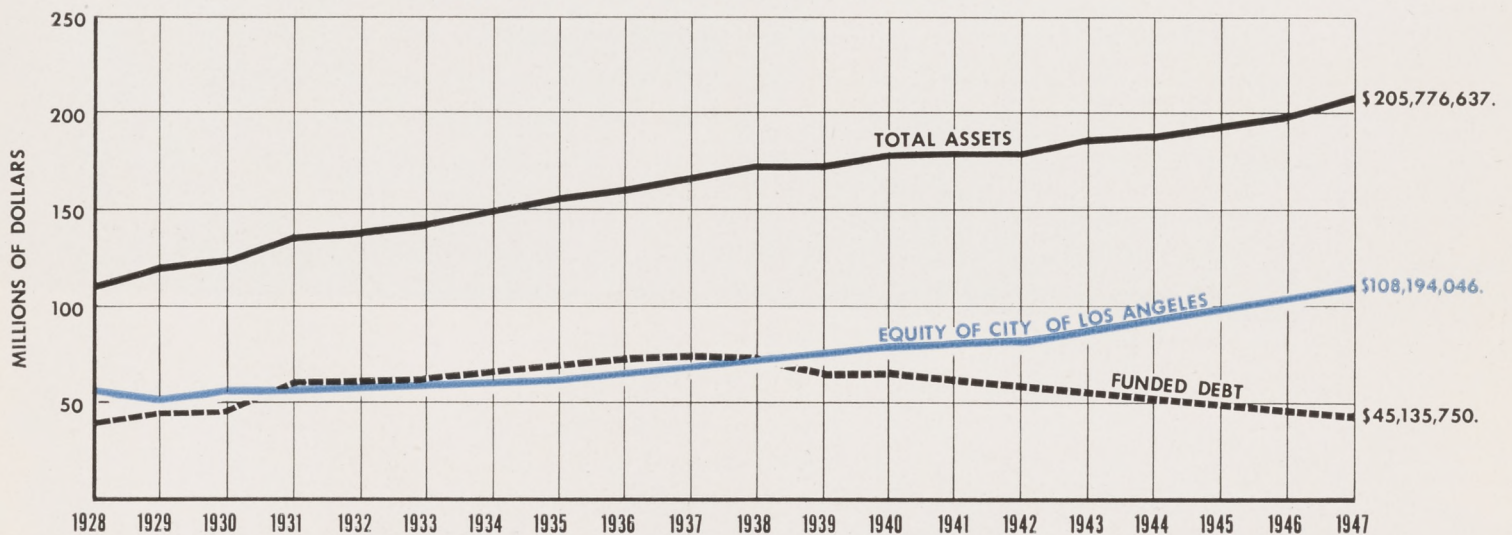


Capital Financing

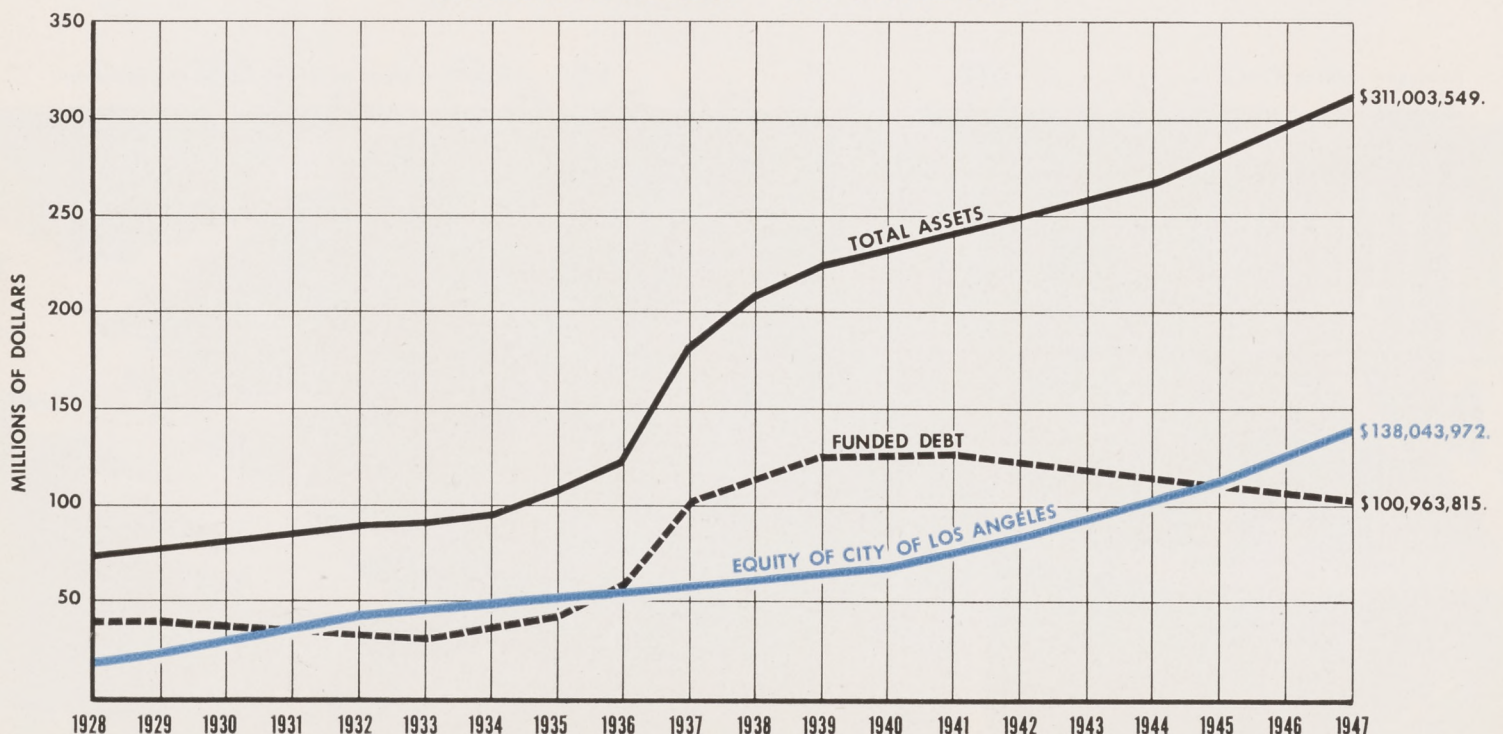
Future capital financing has been simplified through adoption by the voters of Los Angeles of a Charter amendment, which gives authority to the Department to issue at any time revenue bonds of either system, in the amount of the difference between earned surplus and outstanding bonds. Each separate bond issue has heretofore required approval by vote of the City's electorate.

It is expected that the current \$189,000,000 program of capital additions, extensions, and betterments to the Water and Power Systems will be financed half from surplus and half through revenue bond issues. A large portion of the surplus now available was accumulated during the war years, when construction was necessarily at a standstill. To this will be added earnings during the years of construction.

WATER SYSTEM—AT JUNE 30



POWER SYSTEM—AT JUNE 30



Income and Assets

WHAT WE RECEIVED

| | WATER | POWER |
|--|---------------|---------------|
| From sales of power, light and water to customers | \$ 16,122,546 | \$ 45,336,646 |
| From other activities incidental to operating the business | 1,332,818 | 722,506 |
| Total income was | \$ 17,455,364 | \$ 46,059,152 |

WHERE THE MONEY WENT

| | | |
|--|--------------|---------------|
| For production, collection and delivery of water and electricity to homes, stores and factories | \$ 7,681,363 | \$ 23,063,841 |
| For paying interest and expenses on bonds, and for other interest | 1,921,481 | 3,016,252 |
| Appropriated to replace equipment, machinery, tools and other property that depreciates with use, or for assets to be written off | 3,029,614 | 6,115,233 |
| Balance, or net income, for building up the system so that we can meet the rapidly growing needs of new families, new business and new industries, and continue to give good service to present customers, was | \$ 4,822,906 | \$ 13,863,826 |

HOW WE STAND

| | | |
|--|---------------|---------------|
| Total assets, including the things we own and what others owe to us, add up to | \$205,776,637 | \$311,003,549 |
| We owe to others, in the form of bonds we have issued or other funded debt | 45,135,750 | 100,963,815 |
| We have reserved for depreciation, to replace obsolete or worn-out equipment, machinery, tools, etc. | 49,339,840 | 64,182,340 |
| Miscellaneous liabilities total | \$ 3,107,001 | \$ 7,813,422 |
| This leaves the people of The City of Los Angeles with an equity of | \$108,194,046 | \$138,043,972 |

The 1946-47

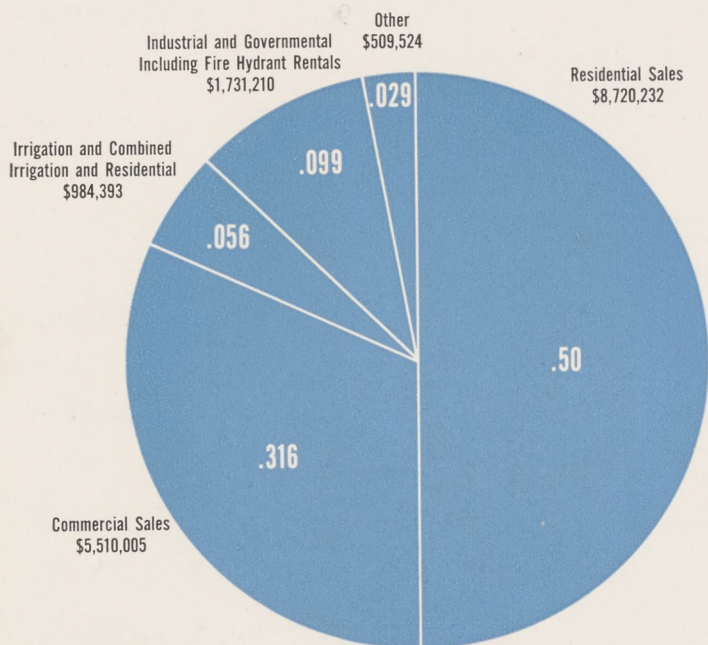
RECEIPTS

Residential users made up the consumer class contributing the largest percentage of income of both Water and Power Systems.

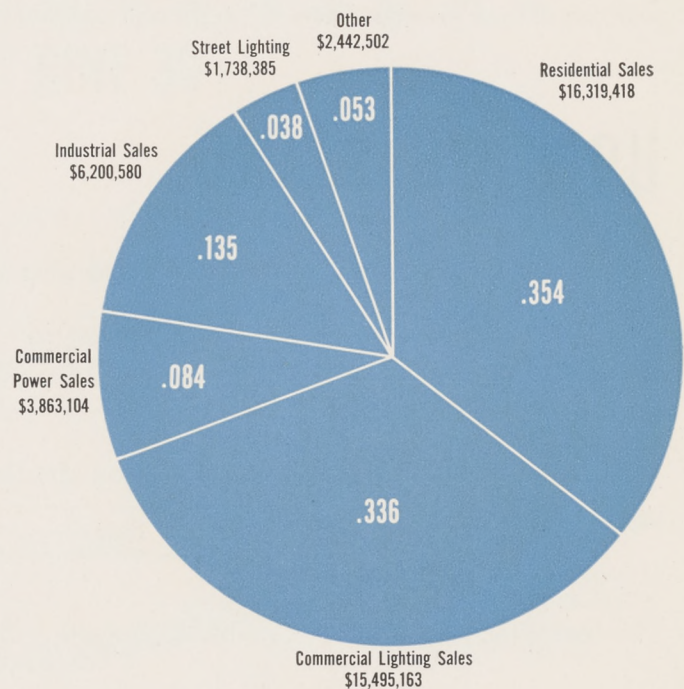
Water System revenues from this source totaled \$8,720,232, with Commercial sales second at \$5,510,005. The year's water bill to industrial customers aggregated \$1,731,210, while irrigation and combined irrigation and residential sales totaled \$984,393. Income from other sources was \$509,524.

Revenues from commercial customers of the Power System were only slightly under those from residential accounts, the latter aggregating \$16,319,418, and the former \$15,495,163. Commercial power sales totaled \$3,863,104; industrial, \$6,200,580; street lighting, \$1,738,385. Revenue from other sources aggregated \$2,442,502.

WATER



POWER



Income Dollar

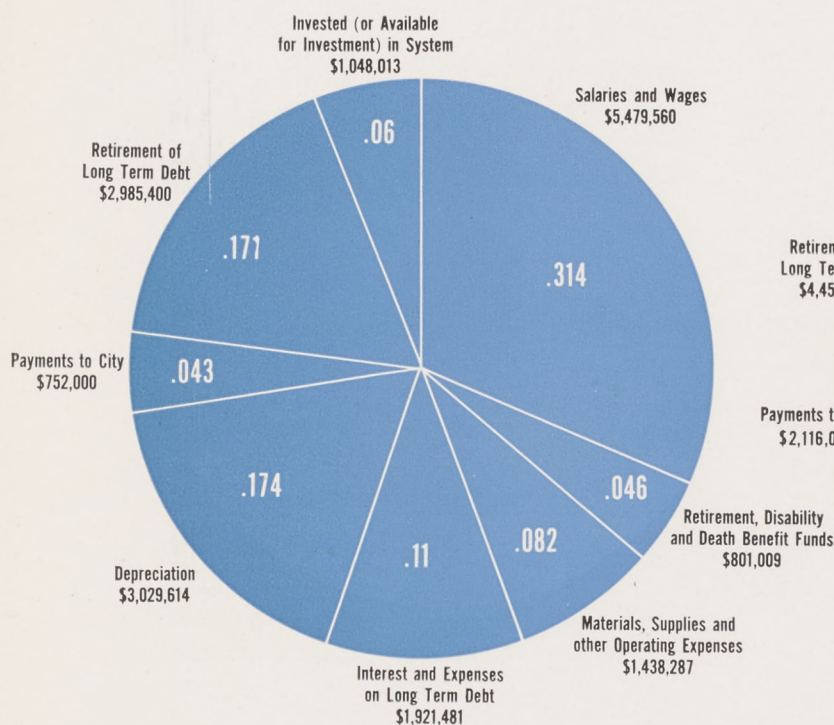
EXPENDITURES

In both Water and Power Systems, wages and salaries represented the largest item of expenditure. Of each dollar of Water revenue, 31.4 cents was paid to employees, and of each dollar of Power revenues, 29.3 cents was paid out in wages. Another .046 cents of each Water dollar and .036 cents of each Electric dollar, received during the year, was paid as the Department's contribution to the Employees' Retirement, Disability and Death Benefit Plan. Disposition of the year's revenues of the two systems was:

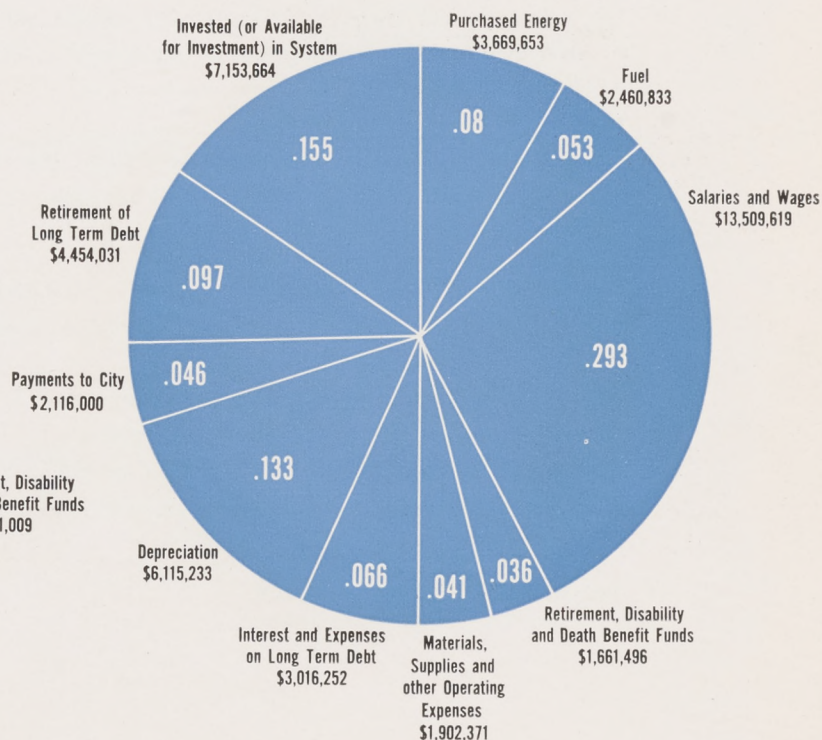
| | WATER SYSTEM | POWER SYSTEM |
|--|--------------|--------------|
| Operating Salaries and Wages..... | \$5,479,560 | \$13,509,619 |
| *Employees Retirement, Disability and Death Benefit..... | 801,889 | 1,661,496 |
| Materials, Supplies, and other Operating Expenses..... | 1,438,287 | 1,902,371 |
| Purchased Energy | | 3,669,653 |
| Fuel | | 2,460,833 |
| Depreciation and Obsolescence..... | 3,029,614 | 6,115,233 |
| Interest and Expenses on Bonded Debt..... | 1,921,481 | 3,016,252 |
| Retirement of Bonded Debt..... | 2,985,400 | 4,454,031 |
| Payment to City General Fund..... | 752,000 | 2,116,000 |
| Available for Investment in System Extension and Betterment..... | 1,048,013 | 7,153,664 |

*Includes Disability payments of \$139,889 in Water and \$460,958 in Power charged to Operating expenses and Capital.

WATER



POWER



Comparative Balance Sheets .

ASSETS

| | June 30 | |
|---|------------------|------------------|
| | 1946 | 1947 |
| PLANT AND EQUIPMENT, at cost..... | \$182,449,458.52 | \$187,254,460.01 |
| LONG TERM RECEIVABLES: | | |
| From the Power System of the Department..... | \$ 1,287,793.20 | \$ 1,243,762.26 |
| Real estate instalment sales contracts..... | 209,884.80 | 102,517.54 |
| | \$ 1,497,678.00 | \$ 1,346,279.80 |
| BOND REDEMPTION AND INTEREST FUNDS: | | |
| Deposits with City Treasurer (including \$1,393,215 and \$1,625,093 invested in United States Treasury bonds) for payment of matu- rities of bond principal and interest coupons..... | \$ 2,559,128.23 | \$ 2,617,353.68 |
| CURRENT AND WORKING ASSETS: | | |
| Deposits with City Treasurer (in July 1947, \$8,966,474 was invested in United States Treasury bonds as permitted by 1947 amendment of City charter)..... | \$ 10,374,146.22 | \$ 10,664,082.49 |
| Cash on hand and revolving funds..... | 126,264.63 | 114,007.82 |
| Customers and miscellaneous accounts receivable, less reserve..... | 1,088,417.25 | 1,193,610.31 |
| Construction and operating materials and supplies, at approximate cost | 1,050,513.51 | 2,032,333.13 |
| | \$ 12,639,341.61 | \$ 14,004,033.75 |
| DEFERRED CHARGES: | | |
| Preliminary survey and investigation expenditures..... | \$ 415,205.09 | \$ 371,548.27 |
| Deferred stores, shop and miscellaneous expenses..... | 66,623.82 | 127,617.48 |
| Unamortized bond issue expenses, less bond premiums received..... | 21,146.84 | 13,901.52 |
| Advance contribution to employees' retirement fund..... | 186,498.05 | 41,442.56 |
| | \$ 689,473.80 | \$ 554,509.83 |
| | \$199,835,080.16 | \$205,776,637.07 |

S....Water System

LIABILITIES

| | June 30 | |
|--|-------------------------|-------------------------|
| | 1946 | 1947 |
| FUNDED DEBT (Exhibit VI): | | |
| General obligation bonds (interest rates 2¾% to 6%) | \$ 44,315,800.00 | \$ 41,831,400.00 |
| Revenue bonds (interest rate 1¼%) | 2,800,000.00 | 2,600,000.00 |
| Funding bonds—Santa Clara Valley damages (interest rates 4% to 5%) | 1,005,349.59 | 704,349.59 |
| | <u>\$ 48,121,149.59</u> | <u>\$ 45,135,749.59</u> |
| Note—Funded debt at June 30, 1947, included \$3,023,400 maturing during the succeeding fiscal year and \$76,000 matured but not presented for payment. | | |
| ACCRUED INTEREST ON BONDS..... | \$ 589,763.64 | \$ 559,490.12 |
| OTHER CURRENT LIABILITIES: | | |
| Accounts payable, accrued expenses, payrolls, etc..... | \$ 763,437.55 | \$ 1,214,373.09 |
| Customers' deposits | 1,203,811.57 | 1,333,138.73 |
| | <u>\$ 1,967,249.12</u> | <u>\$ 2,547,511.82</u> |
| RESERVE FOR DEPRECIATION OF PLANT AND EQUIPMENT... | \$ 46,593,020.84 | \$ 49,339,839.61 |
| EQUITY OF CITY OF LOS ANGELES: | | |
| Investment from proceeds of general taxation (Exhibit III) | \$ 14,834,093.45 | \$ 14,410,501.23 |
| Contributions in aid of construction and maintenance (Exhibit IV) .. | 31,687,471.30 | 32,918,306.52 |
| Earned surplus (Exhibit II) | 56,042,332.22 | 60,865,238.18 |
| | <u>\$102,563,896.97</u> | <u>\$108,194,045.93</u> |
| PURCHASE COMMITMENTS—for materials and supplies, etc.: | | |
| At June 30, 1946..... | \$1,786,000 | |
| At June 30, 1947..... | 3,730,000 | |
| | <u>\$199,835,080.16</u> | <u>\$205,776,637.07</u> |

Comparative Balance Sheets

ASSETS

| | June 30 | |
|--|------------------|------------------|
| | 1946 | 1947 |
| ELECTRIC PLANT AND EQUIPMENT, at cost as defined in the uniform system of accounts prescribed by the Federal Power Commission | \$233,816,725.62 | \$246,341,416.75 |
| BOND REDEMPTION AND INTEREST FUNDS — for payment of maturities of bond principal and interest coupons: | | |
| Deposits with City Treasurer (including \$2,610,482 and \$9,622,341 invested in United States Treasury obligations) | \$ 5,957,365.17 | \$ 9,967,961.53 |
| Deposits in bank | 746,126.25 | 13,626.25 |
| | \$ 6,703,491.42 | \$ 9,981,587.78 |
| SPECIAL DEPOSITS, for acquisition of land and rights of way, etc. . . . | \$ 119,573.23 | \$ 29,063.82 |
| CURRENT AND WORKING ASSETS: | | |
| Deposits with City Treasurer (in July, 1947, \$21,223,375 was invested in United States Treasury bonds as permitted by 1947 amendment of City charter) | \$ 34,082,090.62 | \$ 29,944,931.10 |
| Cash on hand and revolving funds | 112,397.97 | 168,830.94 |
| Customers and miscellaneous accounts receivable, less reserve | 2,615,654.12 | 2,998,962.67 |
| Construction and operating materials and supplies, at approximate cost | 4,134,549.01 | 4,850,829.40 |
| | \$ 40,944,691.72 | \$ 37,963,554.11 |
| DEFERRED CHARGES: | | |
| Unamortized bond redemption and issue expenses — | | |
| Premiums on bonds refunded | \$ 6,359,167.50 | \$ 5,859,466.61 |
| Bond issue expenses, less bond premiums received | 868,534.98 | 823,257.76 |
| | \$ 7,227,702.48 | \$ 6,682,724.37 |
| Advance contributions to employees' retirement fund | 2,093,281.36 | 1,928,817.63 |
| Advance payment of generating charges for Hoover power plant | 7,993,498.76 | 7,527,684.96 |
| Preliminary survey and investigation expenditures | 59,087.01 | 83,092.88 |
| Deferred stores, shop and miscellaneous expenses | 384,030.98 | 465,607.01 |
| | \$ 17,757,600.59 | \$ 16,687,926.85 |
| | \$299,342,082.58 | \$311,003,549.31 |

SPower System

LIABILITIES

| | June 30 | |
|---|--------------------------------|--------------------------------|
| | 1946 | 1947 |
| FUNDED DEBT (Exhibit V): | | |
| General obligation bonds (interest rates $2\frac{3}{4}\%$ to 5%) | \$ 21,206,000.00 | \$ 20,033,000.00 |
| Revenue bonds (interest rates $\frac{3}{4}\%$ to 5%), excluding bonds called for redemption (see below) | 82,839,000.00 | 79,602,000.00 |
| Long term obligation to Water System of the Department (interest rate $4\frac{1}{2}\%$) | 1,287,793.20 | 1,243,762.26 |
| | <u>\$105,332,793.20</u> | <u>\$100,878,762.26</u> |
| Revenue bonds, including premiums, called for redemption prior to June 30, 1946 (funds for payment included in bond redemption and interest funds—contra) | 1,722,692.50 | 85,052.50 |
| | <u>\$107,055,485.70</u> | <u>\$100,963,814.76</u> |
| Note—Funded debt at June 30, 1947, included \$4,599,000 regular maturities occurring in the succeeding fiscal year and \$7,000 matured but not presented for payment. | | |
| ACCRUED INTEREST ON BONDS | \$ 761,568.63 | \$ 696,897.41 |
| OTHER CURRENT LIABILITIES: | | |
| Accounts payable, accrued expenses, payrolls, etc. | \$ 2,293,165.16 | \$ 3,204,683.79 |
| Provision for property damage claims paid in 1946-47. | 248,161.41 | |
| | <u>\$ 2,541,326.57</u> | <u>\$ 3,204,683.79</u> |
| RESERVE FOR DEPRECIATION OF PLANT AND EQUIPMENT.. | \$ 59,063,080.43 | \$ 64,182,340.39 |
| DEFERRED CREDIT, for rent of transmission and other facilities, received from cities of Burbank, Glendale and Pasadena, applicable to future periods. | \$ 3,942,807.92 | \$ 3,911,841.11 |
| CONTRIBUTIONS IN AID OF CONSTRUCTION | \$ 1,935,510.77 | \$ 2,018,064.68 |
| EARNED SURPLUS (Exhibit III) | <u>\$124,042,302.56</u> | <u>\$136,025,907.17</u> |
| PURCHASE COMMITMENTS — for construction contracts and materials, etc.: | | |
| At June 30, 1946 | \$13,830,000 | |
| At June 30, 1947 | 24,730,000 | |
| | <u><u>\$299,342,082.58</u></u> | <u><u>\$311,003,549.31</u></u> |

Statistics Relating to Water Sales

REVENUES:

Years ending June 30—

| | | | | | | | | | |
|------------------------------------|-------------|-------------|-------------|------------|--------------|-------------------------|-------------------------------------|---|----------------------|
| 1946 | \$8,137,910 | RESIDENTIAL | COMMERCIAL | INDUSTRIAL | GOVERNMENTAL | INTERMITTENT IRRIGATION | COMBINED IRRIGATION AND RESIDENTIAL | MISCELLANEOUS (CONSUMPTION NOT METERED) | ALL CLASSES COMBINED |
| 1947 | 8,720,232 | | \$5,143,578 | \$345,224 | \$609,961 | \$519,711 | \$454,042 | \$1,410 | \$15,211,836 |
| | | | 5,510,005 | 350,779 | 555,959 | 499,431 | 484,962 | 1,178 | 16,122,546 |
| Increase (decrease) | \$ 582,322 | | \$ 366,427 | \$ 5,555 | \$ (54,002) | \$ (20,280) | \$ 30,920 | \$ (232) | \$ 910,710 |
| Per cent increase (decrease) | 7.16 | | 7.12 | 1.61 | (8.85) | (3.90) | 6.81 | (16.45) | 5.99 |

UNITS OF 100 CUBIC FEET SOLD:

Years ending June 30—

| | | | | | | | | | |
|------------------------------------|------------|-------------|------------|------------|--------------|-------------------------|-------------------------------------|---|----------------------|
| 1946 | 53,674,219 | RESIDENTIAL | COMMERCIAL | INDUSTRIAL | GOVERNMENTAL | INTERMITTENT IRRIGATION | COMBINED IRRIGATION AND RESIDENTIAL | MISCELLANEOUS (CONSUMPTION NOT METERED) | ALL CLASSES COMBINED |
| 1947 | 57,201,140 | | 42,430,792 | 5,479,751 | 7,075,134 | 33,063,505 | 5,788,704 | | 147,512,105 |
| | | | 44,529,638 | 5,790,365 | 6,733,552 | 31,925,387 | 6,279,715 | | 152,459,797 |
| Increase (decrease) | 3,526,921 | | 2,098,846 | 310,614 | (341,582) | (1,138,118) | 491,011 | | 4,947,692 |
| Per cent increase (decrease) | 6.57 | | 4.95 | 5.67 | (4.83) | (3.44) | 8.48 | | 3.35 |

AVERAGE BILLING PRICE PER 100 CUBIC FEET:

Years ending June 30—

| | | | | | | | | | |
|------------------------------------|----------|-------------|------------|------------|--------------|-------------------------|-------------------------------------|---|----------------------|
| 1946 | \$1.1516 | RESIDENTIAL | COMMERCIAL | INDUSTRIAL | GOVERNMENTAL | INTERMITTENT IRRIGATION | COMBINED IRRIGATION AND RESIDENTIAL | MISCELLANEOUS (CONSUMPTION NOT METERED) | ALL CLASSES COMBINED |
| 1947 | .1524 | | \$1.1212 | \$.0630 | \$.0862 | \$.0157 | \$.0784 | | \$.1031 |
| | | | .1237 | .0606 | .0826 | .0156 | .0772 | | .1057 |
| Increase (decrease) | \$.0008 | | \$.0025 | \$ (.0024) | \$ (.0036) | \$ (.0001) | \$ (.0012) | | \$.0026 |
| Per cent increase (decrease) | .53 | | 2.06 | (3.81) | (4.18) | (.64) | (1.53) | | 2.52 |

AVERAGE NUMBER OF CUSTOMERS

(CALCULATED ON NUMBER OF BILLINGS):

Years ending June 30—

| | | | | | | | | | |
|------------------------------------|---------|-------------|------------|------------|--------------|-------------------------|-------------------------------------|---|----------------------|
| 1946 | 272,277 | RESIDENTIAL | COMMERCIAL | INDUSTRIAL | GOVERNMENTAL | INTERMITTENT IRRIGATION | COMBINED IRRIGATION AND RESIDENTIAL | MISCELLANEOUS (CONSUMPTION NOT METERED) | ALL CLASSES COMBINED |
| 1947 | 281,121 | | 41,106 | 120 | 1,992 | 2,255 | 9,252 | | 327,002 |
| | | | 44,075 | 128 | 1,925 | 2,113 | 9,512 | | 338,874 |
| Increase (decrease) | 8,844 | | 2,969 | 8 | (67) | (142) | 260 | | 11,872 |
| Per cent increase (decrease) | 3.25 | | 7.22 | 6.67 | (3.36) | (6.30) | 2.81 | | 3.63 |

AVERAGE ANNUAL CONSUMPTION PER CUSTOMER

(IN UNITS OF 100 CUBIC FEET):

Years ending June 30—

| | | | | | | | | | |
|------------------------------------|------|-------------|------------|------------|--------------|-------------------------|-------------------------------------|---|----------------------|
| 1946 | 197 | RESIDENTIAL | COMMERCIAL | INDUSTRIAL | GOVERNMENTAL | INTERMITTENT IRRIGATION | COMBINED IRRIGATION AND RESIDENTIAL | MISCELLANEOUS (CONSUMPTION NOT METERED) | ALL CLASSES COMBINED |
| 1947 | 203 | | 1,032 | 45,665 | 3,552 | 14,662 | 626 | | |
| | | | 1,010 | 45,237 | 3,498 | 15,109 | 660 | | |
| Increase (decrease) | 6 | | (22) | (428) | (54) | 447 | 34 | | |
| Per cent increase (decrease) | 3.05 | | (2.13) | (.94) | (1.52) | 3.05 | 5.43 | | |

Statistics Relating to Power Sales

REVENUES:

Years ending June 30—

| | | | | | | | | |
|------------------------|--------------|--------------|-------------|-------------|-----------|--------------|------------|--------------|
| 1946 | \$15,359,315 | \$17,627,551 | \$6,176,656 | \$1,714,382 | \$244,402 | \$41,122,306 | \$ 554,927 | \$41,677,233 |
| 1947 | 16,319,418 | 19,358,267 | 6,200,580 | 1,738,385 | 276,769 | 43,893,419 | 1,443,227 | 45,336,646 |
| Increase | \$ 960,103 | \$ 1,730,716 | \$ 23,924 | \$ 24,003 | \$ 32,367 | \$ 2,771,113 | \$ 888,300 | \$ 3,659,413 |
| Per cent increase..... | 6.25 | 9.82 | .39 | 1.40 | 13.24 | 6.74 | 160.08 | 8.78 |

KILOWATT HOURS SOLD:

Years ending June 30—

| | | | | | | | | |
|-----------------------------------|-------------|---------------|--------------|------------|------------|---------------|-------------|---------------|
| 1946 | 628,695,041 | 1,052,974,239 | 780,856,656 | 68,823,668 | 29,842,641 | 2,561,192,245 | 132,690,203 | 2,693,882,448 |
| 1947 | 698,811,621 | 1,174,861,525 | 756,358,613 | 70,319,109 | 35,794,948 | 2,736,145,816 | 323,165,235 | 3,059,311,051 |
| Increase (decrease) | 70,116,580 | 121,887,286 | (24,498,043) | 1,495,441 | 5,952,307 | 174,953,571 | 190,475,032 | 365,428,603 |
| Per cent increase (decrease)..... | 11.15 | 11.58 | (3.14) | 2.17 | 19.95 | 6.83 | 143.55 | 13.57 |

AVERAGE BILLING PRICE PER KILOWATT HOUR:

Years ending June 30—

| | | | | | | | | |
|-----------------------------------|------------|------------|----------|------------|------------|----------|----------|------------|
| 1946 | \$.0244 | \$.0167 | \$.0079 | \$.0249 | \$.0082 | \$.0161 | \$.0042 | \$.0155 |
| 1947 | .0234 | .0165 | .0082 | .0247 | .0077 | .0160 | .0045 | .0148 |
| Increase (decrease) | \$ (.0010) | \$ (.0002) | \$.0003 | \$ (.0002) | \$ (.0005) | \$.0001 | \$.0003 | \$ (.0007) |
| Per cent increase (decrease)..... | (4.10) | (1.20) | 3.80 | (.80) | (6.10) | (.62) | 7.14 | 4.52 |

AVERAGE NUMBER OF CUSTOMERS

(CALCULATED ON NUMBER OF BILLINGS):

Years ending June 30—

| | | | | | | | | |
|------------------------|---------|--------|-------|-------|-----|---------|-------|---------|
| 1946 | 474,168 | 93,440 | 6,942 | 966 | 210 | 575,726 | 5 | 575,731 |
| 1947 | 481,786 | 99,428 | 7,656 | 1,018 | 210 | 590,098 | 6 | 590,104 |
| Increase | 7,618 | 5,988 | 714 | 52 | — | 14,372 | 1 | 14,373 |
| Per cent increase..... | 1.61 | 6.41 | 10.29 | 5.38 | — | 2.50 | 20.00 | 2.50 |

AVERAGE ANNUAL CONSUMPTION PER CUSTOMER

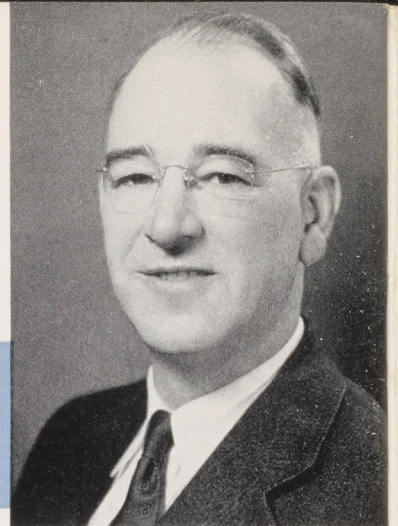
(IN KILOWATT HOURS):

Years ending June 30—

| | | | | | | | | |
|------------------------------------|-------|--------|----------|---|---|---|---|---|
| 1946 | 1,326 | 11,269 | 112,483 | — | — | — | — | — |
| 1947 | 1,450 | 11,816 | 98,793 | — | — | — | — | — |
| Increase (decrease) | 124 | 547 | (13,690) | — | — | — | — | — |
| Per cent increase (decrease) | 9.35 | 4.85 | (12.17) | — | — | — | — | — |



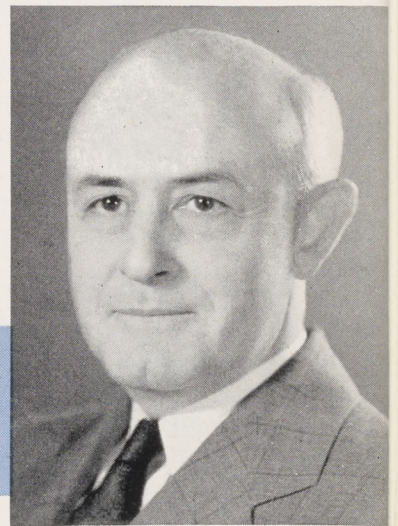
SAMUEL B. MORRIS
General Manager and Chief Engineer



LAURANCE E. GOIT
Chief Engineer of Water Works and Deputy General Manager



CHARLES P. GORMAN
Chief Electrical Engineer and Deputy General Manager



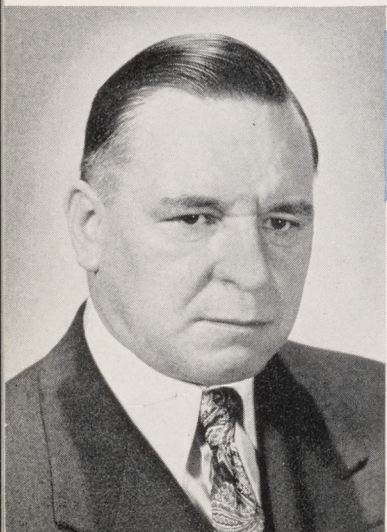
CLYDE ERRETT
Controller and Chief Accounting Employee



GILMORE TILLMAN
Chief Assistant City Attorney for Water and Power



BURTON S. GRANT
Assistant Chief Engineer of Water Works



WILLIAM S. PETERSON
Assistant Chief Electrical Engineer



ROY MARTINDALE
Assistant Chief Electrical Engineer

U. H. T. B. L. 0249

